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THE RÔLE OF THE TEACHER IN THE MOST EXPEDITIOUS AND ECONOMIC LEARNING

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The material presented in this paper consists, in the main, of facts revealed by a study of learning which the writer has been pursuing for the past five years (1, pp. 1–188). From this and other recent studies of acquisition will be selected such facts as emphasize the importance of the teacher's work and show most clearly the specific rôle played by the teacher in learning.

Psycho-physically speaking, learning and the acquisition of skill consist in the formation and development of a group or groups of special associations. Recent studies of learning have described the specific habits formed in certain special kinds of learning (8, pp. 353–358). Much, also, has been determined about the way in which these special associations are formed and developed in the process of learning (3, pp. 28–35; 4, pp. 355–375; 6, pp. 287–305; 1, pp. 23–99), and many of the factors and phenomena have been described which help or hinder the development and growth of the associations to be formed. What do these studies tell us about the rôle of the teacher in economic learning?

It has been found, for example, that in learning typewriting, two groups of habits are formed (1, pp. 23–75): (*a*) habits of manipulation, a complicated hierarchy of psycho-physical habits having to do with the writing as such, and (*b*) habits of control, a group of more general habits acquired in the course of the learning, well characterized by the phrase, "learning to learn." In the development of this second group of habits, which includes such specific acquisitions as learning to develop most economically the special writing habits to be formed (1, pp. 68–75), learning how to meet more successfully the many special difficulties

encountered in the learning, how to economize and apply one's attention and energies, learning to keep the mind properly focused on the work, learning to acquire and maintain the most helpful feeling tone, *et cetera*,—the teacher can be of little service except in helping the student to overcome the many special difficulties encountered in the learning. He can not make the learners always have the right attitude towards the work; he can not show them how to apply their attention and energies in the most economic way; he cannot teach them to see more readily the adaptations which will give the better mastery over the task; but if he knows the specific difficulties which the learner encounters and at what stages of advancement they occur, and realizes that they *must* be promptly dealt with and overcome, if the learning is to be economic, he may be of much assistance to the learner even in the acquisition of these habits of control. The student learns, if he succeeds, that every difficulty must be squarely met and mastered before complete success can be attained, but the lesson usually comes hard. The right sort of direction and help from a skilled teacher would save much time and energy because the teacher will insist that all difficulties are squarely met and promptly overcome as they appear, and by skillful direction will prevent many of the difficulties generally encountered in the learning.

The number and kinds of errors made by the learners of typewriting, as interpreted and explained by their introspective notes, revealed the fact that many hindering associations were developed in all stages of the learning. That is to say mental and physical tendencies were formed in every stage of advancement which greatly interfered with the development and exercise of the habits to be formed. At certain definite stages of advancement these interferences became so numerous and troublesome that the learners had to give almost their entire thought and attention to avoiding and overcoming them. One illustration will indicate the importance of making the right adjustment to this type of difficulty.

Four and a half months after the regular practice of the learners ceased, one of the regular subjects was given ten writing tests under the same laboratory conditions that governed the regu-

lar practice. Every precaution was taken to keep conditions uniform. A year and a half after the regular practice ceased, and a year after the first memory tests, another series of ten tests was given with the same precautions as before. The score for the first memory tests was slightly lower than for the last ten tests of the regular practice (1, pp. 75-84). But the second memory tests, taken after a rest interval of a year and a half, during which time a typewriter was not even seen, showed an average daily gain (deducting all errors) of eighty-five strokes. Similar gains during long periods of no practice or study have been noted by other investigators in different fields of acquisition (2, pp. 327-340; 10, pp. 131-133), the increase in skill indicated by such gains being generally assumed to be due to some sort of neural growth (5, pp. 126-131; 6, p. 297), if any explanation is offered. Swift does not attempt to explain his results.

By processes too detailed to be described here it was determined that the gain shown by our memory tests was due not to some form of neural growth but to the disappearance, with the lapse of time, of numerous psycho-physical difficulties, interfering associations formed in the process of learning, which, as they faded, left the more firmly established typewriting associations free to act. It was determined that such hindering associations were formed in all stages of the learning, at certain definite stages of advancement in masses, and that after the rest interval of a year and a half they had noticeably disappeared, as witnessed by the fact that the associations involved in the writing now worked more smoothly and easily then ever before.

The significance of these interferences for learning, and the importance of overcoming this type of difficulty now becomes clear. In the process of learning typewriting, the development of many conflicting associations is a natural but more or less unnecessary accompaniment of the development of the associations to be formed. With expert direction from a skilled teacher these mental interferences may be kept to a minimum. Without such help and direction the learner pushes himself into all sorts of blunders and mistakes, most of which never make any objective manifestation of themselves. These must be carefully avoided and elim-

inated before future progress is possible. It was clearly determined that the final perfection of the elemental associations involved in learning typewriting occasioned difficulties which gave opportunity for the formation of many interferences, causing much loss of time and energy. Other investigators have described different aspects of the same type of difficulty. Cleveland observed that his subjects, at certain stages of learning to play chess, could not play in proportion to their knowledge of the game (6, p. 298). Swift noticed that, at certain stages in the learning of a new language, new factors accumulated too rapidly for immediate assimilation. He thought that the plateaus in the learning curves represented, among other things, "the minds revolt against further crowding and cramming" (9, p. 311). Our study of typewriting showed that our learners naturally tended to push themselves along too fast at the critical stages in the learning, giving opportunity for the development of masses of interferences. It is the privilege of the teacher, who should know how the subject is learned by the student, so to guide and direct the learners that a minimum of these interferences will be formed. By carefully directing the activities of his students in advance, he not only prevents the formation of many hindering associations but makes sure of the perfection of the elemental habits that must be formed before the highest levels of success can be attained.

The teacher should also know the most favorable periods for work and rest in a given field. Our study showed that practice when the learners were nervous or tired was not only worthless so far as strengthening old associations was concerned, but was positively injurious because it made conditions favorable for forming wrong habits of mind and hand. The best results for learning can only be obtained when the periods of practice or study are, on the one hand, of such length as will give the greatest amount of practice to the habits to be formed with the least opportunity for developing interferences, and when the intervals between the practice or study periods are, on the other hand, of such length as will insure the most complete dropping out of the interfering tendencies naturally formed in the course of the learning, with the least possible fading on the part of the associations to be established. Fur-

ther investigation must determine what the most economic periods of work and rest in the different fields of learning are. It will be the privilege of the teacher, when this shall have been done, to make the right adjustment here as well as so to guide and direct his students that a minimum of interferences will be formed.

The rôle played by the teacher in economic learning will be seen to be more important still when it has been pointed out how the first group of habits mentioned above (habits of manipulation) was formed and developed. It was determined that these typewriting habits were developed in a particular manner. The earliest associations used in the writing were adapted from the masses of familiar associations and activities (mental and physical) which the learners brought with them, ready formed, to the task. In the beginning the learners' attention and energies could not be applied to the writing in a direct and economic way. Under the influence of the strong desire to succeed there were called up masses of old and familiar associations or forms of activity, most of which were not directly serviceable. From these old associations and excessive activities there were formed, by the double process of selection and elimination, the first laborious methods of writing. By the elimination of certain details, and the simultaneous reorganization of others, into more economic methods of dealing with the problem of writing—a process called forth by the extreme exertions of the learners in their desire for greater efficiency and speed—these first circuitous methods of writing were simplified, refined, and changed, until, sheared of their accessories, they formed the first direct (letter) associations used in the writing. These letter associations were in turn short-circuited and reorganized, as the practice continued, into more econominal habits of writing, of which new groupings they became the elemental parts, and into which their identity was gradually merged while these higher (word) habits were in turn worked over into yet higher complexes by processes similar to those operative in their own formation. Throughout this process of developing higher-order habits a sort of unconscious struggle for existence occurred among the many activities and modes of work called forth, resulting in the survival of those methods of work which proved themselves, under the

circumstances, the most efficient. Many of the associations and activities called up existed but to be eliminated, others were selected and progressively organized into the higher-order habits of the hierarchy.

Two important facts were determined about this inventional side of the learning. It was found that the new adaptations or forward steps in the development of these higher-order habits were never planned but made quite unintentionally so far as the learners were concerned. The new and better ways of writing were simply fallen into when the conditions for learning were favorable and when the learners were working under strain. It was observed that they were regularly executed marginally for a time before the learners became aware of their presence or value for the work. It would, therefore, seem that the teacher could be of little service to the learner in the development of higher-order habits. He can not direct the selections to be made, neither can he make the learner choose the better way when the opportunity is presented.

A second fact was determined, however, which shows that the teacher plays a most important rôle even in this inventional part of the learning. In their study of telegraphy Bryan and Harter found that years of daily practice in receiving messages at ordinary rates would not bring a man to his maximum ability to receive, while men whose receiving curve had been upon a level for years frequently acquired the ability to receive at a much faster rate when forced to do so in order to secure or hold a position requiring the greater skill. They decided that it took "intense effort to educate" and believed that "one reason why sixty-five per cent of those who begin to study telegraphy get discouraged and quit when they reach the first plateau is that they do not make the painful effort necessary to become experts (3, p. 51).

Our study of typewriting verified this result. It showed that the necessary pre-condition for taking the above named forward steps in the learning was *extreme* effort, carefully applied to the details of the work on a good day, after all old associations had been carefully revived and a favorable writing psychosis devel-

oped (1, pp. 92-95). It was further determined that less effort was actually put into the work, by the learners at all those stages of practice where little or no progress was made, than at the stages where improvement was steady and rapid (1, pp. 140-147). Moreover, the particular rôle which effort played was clearly revealed. Relaxation of attention or effort not only kept the learners from using the most economic methods of writing, lately acquired, it kept them from making new adaptations. When attention was relaxed they were forced to do the writing in a more primitive and automatic way. That is to say with relaxed attention they could not hold themselves on the frontier of their achievement where new adaptations in method might be laid hold of.

It was further determined that the simpler ways of writing used by the learners (lower-order habits) tended strongly to persist long after they had been superseded by more economic methods of writing. The law of habit plays a double rôle in learning. The associations used in the early writing offer a certain resistance to the new ways of writing which are being or may be developed. They strongly tend to persist long after more economic habits have been developed, a tendency which requires constant effort to overcome. At every lapse in attention or relaxation of effort the old habits stepped forward, as it were, and assumed control. The tendency to continue the work on the plane of efficiency already attained is constantly present. In learning typewriting it was only when the learners were urging themselves forward so fast that the outgrown habits could not be used, that more economic methods of work were developed. All elementary habits must be mastered and carefully perfected, to be sure. By no device may this be slighted or omitted. But a matter of as much importance for progress in learning as the perfection of elemental habits, is their progressive organization into better methods of work. They must as rapidly as possible be superseded by higher-order habits if the learning be not arrested.

It should also be pointed out that leaving the old habits behind and forming higher-order habits out of outgrown elemental ones is a process which becomes progressively more difficult as advance-

ment proceeds. Most learners are masters of nothing, and therefore have had little or no experience in learning beyond beginning stages where progress is easy and rapid. In the advanced stages new adaptations become harder and harder to make, increasing the tendency to continue the work in old habitual ways. The learner, therefore, has special need for the assistance of a skilled teacher in this inventional part of the learning, (1) to see that important details are thoroughly learned, (2) to provide every possible stimulus to effort when the conditions are favorable for developing better methods of work.

The specific rôle to be played by the teacher in economic learning is made still more concrete by the fact that an actual relearning was found to occur each day. It was determined that old and newly formed associations would not work as easily and readily upon first beginning to write as later in a test (1, pp. 103-109). A little time was required at the beginning of each test for reviving old associations and for developing a favorable set of mind (typewriting psychosis). It was found that on an off day and during the early part of a test a learner could not work to advantage with a "do-or-die" attitude, as our learners sooner or later found out for themselves. It was impossible for them to make new adaptations before the older associations had been fully revived. It was strenuous effort carefully applied to the details of the work when all conditions were favorable and when the learners were thoroughly warmed up and had the right psychosis for making adaptations, that lifted them out of habitual methods of writing onto higher planes of work. A skillful teacher will, therefore, not try to crowd his pupils at the beginning of a lesson but will see that old associations are carefully revived, by slow practice, discussion, and reviews. He will not try to force his learners on the bad days, when they are "all out of sorts," or before they are warmed up, but will see to it that maximum effort is applied when the conditions *are* favorable for making a jump. It is a part of the teacher's business to keep conditions as favorable as possible for learning and to provide suitable stimuli when increased effort will result in gain.

But while the teacher can be of much assistance in the matter of

developing these typewriting habits, as we have seen, his chief function in economic learning will not appear until it has been pointed out how these habits of manipulation are naturally perfected. As previously stated the necessary pre-condition for developing a hierarchy of habits, such as must be acquired in all complex forms of learning, like typewriting, is the gradual and complete perfection of the elemental associations which combine to form the higher-order habits of the series. By no device can this be omitted. The manner of their growth and final perfection, therefore, becomes a matter of first importance.

It was once thought that the logical method of learning was also the natural or psychological method, that the most economical way of learning a language, for example, was first to learn the letters perfectly, then combine them into syllables, learning words by combining syllables, sentences by combining well known words, and thoughts by combining sentences etc. Studies of learning have shown, however, that in natural learning associations do not so develop (9, pp. 304-305; 8, p. 355; 11, p. 295). It has been determined, that, while the special habits formed, do appear in a definite order of succession, none of the elementary habits reach complete maturity before the next higher-order habits become possible. On the contrary the various associations to be formed naturally develop together and before any of the special habits have become fully perfected, the next higher order habits are already well along in the process of their development, and operative in the work.

Bryan and Harter found, for example, that practice in receiving telegraphic messages in sentence form increased their learners' ability to take isolated letters and words. They also found that more mistakes were made in receiving disconnected letters than in receiving, at a much more rapid rate, letters forming words, more mistakes made in receiving disconnected words than in receiving, at a still higher rate, connected discourse, showing that the development and mastery of higher-order habits "lead to greater accuracy in detail," by helping perfect the elemental habits involved (4, p. 358). Later studies have more conclusively shown

that in natural learning elemental habits are not finally perfected *before* the higher-order habits begin to form but that the development of the higher and perfection of the lower goes hand in hand throughout the learning, that the lower-order habits are perfected in and through the formation of the higher even as the further development of the higher is dependent upon the perfection of the lower (1, pp. 85-90). They have shown that the natural and most economic method of acquiring habits is to let them thus grow and develop together. The natural and most economic method of learning demands that we practice with the highest-order habits possible, thus learning all the units in their proper setting (4, p. 368). The role of the teacher in this part of the learning would, therefore, consist in seeing that this natural, and economical method of learning be followed instead of some artificial, logical method.

But even when this psychological method of learning is followed the final perfection of the elemental habits presents a peculiar difficulty hard to overcome successfully. The epoch making study of Bryan and Harter showed that at certain stages of learning telegraphy the practice of their learners did not result in the usual advancement. There were long stretches in the practice where no appreciable improvement was made, periods of work marked by plateaus in the learning curves. After much painstaking investigation Bryan and Harter decided that these periods of arrest were a very important and necessary part of the learning process, representing a condition brought about quite naturally and generally by the way in which a hierarchy of habits was developed (4, pp. 356-358). Later studies have confirmed the existence and emphasized the importance of these periods of arrest (1, pp. 18-21, 140-148). In his latest study of learning Swift writes: "By far the greater part of the learning period is spent on plateaus, when both teacher and pupil, failing to understand the situation, feel that they are marking time" (9, p. 310).

The careful analysis of the learning consciousness obtained from our learners for all stages of learning typewriting, verified by objective records of their writing and complete records of their working

pulse, showed that the plateaus in these curves were caused, not by the order in which the typewriting habits developed, but by the learners' failure to overcome certain specific difficulties encountered at those stages of advancement where certain elemental habits or groups of such habits were being finally perfected (1, pp. 85-90, 140-148, 156-157). It was determined that all special associations formed in learning typewriting were finally perfected very gradually and slowly (1, pp. 98-99). They required a minimum of oversight for a very long time after they seemed to be entirely self regulative. It was also determined that as consciousness was gradually relieved of the oversight of details by the automatization of the associations forming, attention tended naturally and strongly to slight the details of the work and to wander away from the writing as a whole, busying itself with the irrelevant images which at these stages swarmed in the fringes of consciousness. At these critical stages in the learning one of three things normally happens.

First, the learner may be caught more or less unawares by this lapse in spontaneous attention and effort and continue to work as carefully as usual but more and more halfheartedly until a habit of working lazily is formed. He is caught unawares by the law of habit and continues using lower-order habits when he should be forging ahead making new adaptations. There will be a further perfection of the habits already developed provided mistakes are avoided; but since elemental habits can best be perfected in and through the development of the higher-order habits, even this will be slower. No genuine progress in learning can occur unless new adaptations are made.

Second, there is more apt to go with the lapse in attention and effort a growing carelessness and general indifference towards the work, which, when the lack of progress brings a spur to effort, results in a careless misapplication of attention and effort. The learner assumes a freedom which he does not possess and pushes on to the development of higher-order habits *before* the elemental associations have been sufficiently perfected for this to be safely done. The slight conscious direction needed for so long a time to perfect elemental habits is neglected, and practice in error and

arrest of learning result, because all interferences so occasioned, must be overcome before further progress in learning can be made.

Third, the learner may, however, so successfully deal with the natural lapses in attention which occur at the critical stages in the learning, conquering every tendency to lag by the application of well directed effort, that progress will be continuous, and all plateaus eliminated from his learning curve.

All plateaus in our learning curves were caused by the failure discribed in the first or second alternative or by both acting together (1, pp. 161-166). The third alternative was also represented in our experiments, one or more plateaus being eliminated from the learning curves by the successful mastery of the difficulties encountered at the corresponding critical stages. But it should be pointed out that the critical stages present difficulties, which the average learner, who does not know the cause of the trouble, finds very hard to overcome. The learner, if left to himself, rarely if ever solves the problems presented in the most economic way. He will rarely or never be able to meet successfully the more serious critical stages. He cannot of himself make amends for the natural lapses in spontaneous attention, because the most effective incentives to effort, those born of progress and success, are lacking. He cannot make up the deficiency by a sheer act of will. He may try as hard as he may, his energy mainly goes into the trying instead of into work activities. Artificial stimuli must be supplied from without, by grim necessity, some future interest or end, etc. The learner, at these critical stages, has special need for the help of a skilled teacher, (1) to see that he attends to the necessary details until they are thoroughly learned, (2) to provide such incentives to effort, emotional helps, and interest in the higher phases of the work as may fully atone for the lapses in attention which the final perfection of the elemental habits naturally brings on.

A skillful teacher may also do much by way of inducing in his learners a helpful feeling tone. It was determined that in learning typewriting a pleasant feeling tone and an attitude of interest always accompanied the periods when the work was done well or

when progress was rapid. A distinctly unpleasant feeling and an attitude of indifference always accompanied the periods of practice where the work did not go well, and the stages in the learning where little or no improvement was made. It was also determined that the pleasant feeling had a helpful reactionary effect on the work, the unpleasant feeling a restraining, hampering effect. In fact so close was the correlation that one might have judged the learner's degree of success from his general feeling tone. It was also determined that the development of the attitude characteristic of the expert typist was one of the important acquisitions in the learning. In the early stages of learning our subjects were all very much interested in the work. Their whole mind seemed to be spontaneously held by the writing. They were always anxious to take up the work anew each day. Their general attitude and the resultant sensations, constituted a pleasant feeling tone, which had a helpful reactionary effect on the work. Continued practice, however, brought a change. In place of the spontaneous, rapt attention of the beginning stages, attention tended, at certain definite stages of advancement, to wander away from the work. A general feeling of monotony, which at times assumed the form of utter disgust, took the place of the former pleasant sensations and feelings. The writing became a disagreeable task. The unpleasant feelings now present in consciousness exerted an ever restraining effect on the work. As an expert skill was approached, however, the learner's attitude and mood changed again. They again took a keen interest in the work. Their whole feeling tone once more became favorable and the movements delightful and pleasant. The expert typist, who served as subject in our experiments, so thoroughly enjoyed the writing that it was as pleasant as the spontaneous play activities of a child. But in the course of developing this permanent interest in the work there were many periods in nearly every test, many days, as well as stages in the practice as a whole when the work was much disliked, periods when the learning assumed the role of a very monotonous task. Our records showed that at such times as these no progress was made. Rapid progress in learning typewriting was only made when the learners were feeling good and had an attitude of interest

towards the work. It is the privilege of the teacher when such lapses in interest occur, to give such encouragement as will change, at least in part, the learner's general feeling tone.[1]

SUMMARY

The studies of learning thus far made are few in number and somewhat varied in method but they, nevertheless, show that the teacher plays a very specific and important role in all acquisition. The specific kind of help to be given may be summarily stated as follows:

1. It is the teacher's business to see that the particular types of difficulties encountered in learning are properly dealt with and promptly overcome as they appear. To do this in the most helpful way the teacher must know the specific difficulties which his learners encounter, at what stages of advancement they occur, the

[1] There will, of course, be idlers in the pedagogical market place ready to say, nothing new here! We have known all this before. It is but another way of saying that the teacher must know the child and the subject he is to teach. For if he understands his subject, he will know how it is learned, where the critical stages in the learning appear, how to direct his students so that the learning may be made continuous and economic. If he understands his pupils as he should he will know how to give the required encouragement. We have known it all before. Of what use is Experimental Pedagogy anyway? It only tells us what we already know. There is no use of stopping to take stock.

Granting that the scientific study of education could do nothing more than tell us what we really know and what we do not know about things educational it would be amply worth while. But it may do very much more. Suppose we knew specifically all that learning meant on its psychological side or had complete reliable records of the process of learning as it naturally works itself out in the various fields of acqusition, would we not know how the various things to be learned could be most economically acquired? Would we not know how the various school subjects could be most helpfully taught? Would we not know the specific rôle to be played by the teacher in economic learning? And this is but one of the many problems demanding solution.

When all the idlers, who throng our educational ranks, together with their scholastic advisers, come to feel the need of placing educational effort on a firmer basis than can be given by mere opinion and experience, when they come to consider it their solemn duty to investigate every problem relating to education and learning by the most exact methods that can be devised, the role of the teacher in economic learning will be fully determined and the work of the teacher recognized as the dignified profession it is, as high as any in which men can engage.

best ways of meeting them, as well as understand the psychological importance of their prompt and complete elimination. In a word he should know how that particular subject is naturally learned.

2. A teacher may be guidingly helpful in the acquisition of right methods of study and work, a phase of the teacher's problem often neglected. Students may learn unaided how to acquire a special type of habit in a natural and economic way. They may acquire a unique sort of special skill which can be carried over to other fields of learning and used whenever a similar type of habit is to be formed (7, p. 339), but the method employed is of the trial and error type. A skilled teacher may be of special service to his students in this process of *learning to learn.* It is his privilege to see not only that the best methods of work are acquired but that they are acquired in the most economic way.

3. There is a natural, economic way of acquiring the special habits formed in all kinds of learning. There are many unnatural, circuitous, wrong methods of acquiring them, methods which eventually succeed but with much loss of time and energy. It is the privilege of the teacher to see that the most natural and economic method of forming these specific habits be employed by his learners.

4. (In all regular learning and even when a natural and economic method is followed many wrong habits of mind and hand are regularly formed.) By skilled direction, given in advance, the teacher may entirely prevent or greatly minimize the formation and exercise of such interferring tendencies. One of the most important functions of the teacher is so to guide and direct his students that only a minimum of interferences will be formed.

5. In the matter of perfecting the specific habits to be formed the teacher, likewise, plays an important rôle. He insists that elemental habits are thoroughly learned, a process which cannot be neglected or slighted if the learning is to proceed in an economic way. He prevents the learner from pushing himself along too fast at the critical stages and prevents a too rapid presentation of details. By his careful direction he makes it possible for all details to be organized and assimilated in a natural way.

6. To yield the best results for the growth and perfection of the

associations to be formed a certain amount of regulated practice is required. It also appears, from the studies made, that definite periods of work and rest yield the best results for fixing the habits to be acquired. It will be the privilege of the teacher, when the most economic periods of work and rest shall have been determined to see that his students work in this economic way.

7. But it is not enough that elemental habits be perfected in this natural and economic way, they must as rapidly as possible be outgrown, reorganized into higher-order habits if progress in learning be not arrested. The natural tendency to be caught by the law of habit and to continue the work upon low planes of achievement when better methods of work may be acquired must be counteracted by special incentives to effort provided by the teacher. One of the special duties of the teacher is to provide such incentives to effort, and emotional helps, as may fully atone for the natural lapses in spontaneous attention which occur at the critical stages in the learning. By giving the right sort of direction and encouragement at these critical stages the teacher may eliminate most if not all the plateaus from his students learning curves.

8. It has been shown that it is intense effort carefully applied to the details of the work when the conditions are favorable for learning that forces the learners to make new adaptations in method. It, therefore, becomes the duty of the teacher to urge his learners on to greater endeavor when the conditions for learning are favorable for making inventions, and to encourage a more leisurely application of effort when conditions are unfavorable for the taking of such forward steps.

9. Many things, singly or combined, help or hinder the process of learning, such as fatigue, the hygienic condition of the learner, his immediate environment, variations in natural incentives to effort and the like. It is within the province of the teacher to make conditions favorable, both for the development and further perfection of the associations to be formed.

10. The task which taxes the powers of the teacher more, perhaps, than any other is keeping his learners always feeling well and developing in them an attitude of permanent interest in the work. By careful direction and wise encouragement on the part of the

teacher his students gradually acquire the habit of succeeding in all their tasks. This brings with it, quite naturally, the attitude of interest and the pleasant feeling tone so necessary for future success. The most rapid progress in learning is made when the students are interested in the work and feeling well.

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HAS THE DRILL BECOME OBSOLESCENT?

A Preliminary Discussion, Particularly With Reference To Spelling

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Time was when the drill was the be-all and end-all of the educative process. In that day the three R's were sung to the wailing tune of the "rod, rule and remembrance." That time has happily gone by. But, in its wake has followed a reactionary movement which threatens even more dire consequences than such as undue emphasis of the drill could have produced. Today the child for the first time in history perhaps has come fully into his own. He is now to be his own arbiter in matters of educational controversy. His likes and dislikes, his interests and desires, are to furnish the final court of appeal. The doctrine of interest has been followed to its logical conclusion; and the child has spoken. He prefers to be entertained and amused, rather than disciplined, drilled or trained. In consequence the drill has become a byword in educational parlance; a sort of relic of past pedagogic barbarities. The picture becomes less gloomy, however, when we reflect that the drill has been completely proscribed only by those disciples of 'soft-pedagogy' who have not yet exercised any dominating influence upon the rank and file of the teaching body, and that a tendency is manifest in many quarters where the drill has been tabooed to return to its reasonable use as one of the legitimate instruments of the educative process. The many present-day attempts to introduce some form of group or class-individual instruction bear testimony to this return.

The objections urged against the drill are numerous. It has received entirely too much prominence, ranging all the way from the exclusive mechanical drills and the simultaneous repetitions of the typical Chinese school to the rote memorizing of text-book and dictated statements in the average American school. It represents the line of least resistance for the naturally slothful; it is the lazy boy's refuge; or it is a monotonous grind against whose intolerable drudgery children rebel, or to escape from which they flee from the school in dismay, and which produces nothing but servile followers, educational stokers and hewers of wood. It fosters the pernicious habit of cramming. More than this, it is uneconomical, for it steals the child's time. He is obliged to spend his time going over old materials when he should be acquiring new facts. Instead of being nourished his powers are being deadened. Finally the drill, in practice, proves inefficient, as shown by experiment. As evidence in point, the anti-drill advocate refers to Stone's study of a drill subject like arithmetic and quotes his conclusion to the effect that a superior product in arithmetic will be found about as frequently in schools devoting less than the average time to arithmetic as in those devoting more than the average time, the amount of time spent in preparation being no guarantee of efficiency. Or he refers to Rice's study[1] of spelling, a drill subject, and his findings against the spelling grind; or to Cornman's investigation[2] of the results of teaching spelling by the incidental method (without regular study and recitation periods), and to his conclusion that the present spelling drill "adds little or nothing to the effectivenes of the mere incidental teaching of spelling," and that its importance is thus practically negligible. Or reference is made to current practice in the teaching of modern languages. Instead of drilling on new words and vocabularies, as formerly, the student now begins with copiously translating and using words. The amount of reading is increased to compensate for the reduction of time devoted to drill. Conformably to the *ipse dixit* of these experimenters we

[1] Rice, The Futility of the Spelling Grind, The Forum, April and June, 1897.

[2] Cornman, Spelling in the Elementary School, 1902.

find F. M. McMurry[3] predicting that extensive drills in the future will be the recourse of those teachers who lack the energy or the ability to think.

What can be said in reply to these criticisms? What arguments can be advanced on the other side of the question? Most of these arguments we can only state point-blank fashion in the present discussion.

1. It is probably an exaggeration to say that the child reacts against or abhors the drill. Repetition may be wasteful, but it is certainly easy, and there is a time when the child takes a positive delight in iteration and repetition. Naturally so, because the process has an instinctive basis: the circulatory reactions of imitative actions.

2. The child stands in need of certain intellectual habits as well as motor habits. Certain mental operations should be reduced to an automatic basis. Many experiences must function unconsciously; *e.g.*, the association between certain visual symbols and certain sounds (spelling), the manipulation of the fundamental mathematical processes, the practical application of the rules of grammar, the conversion of the moral and social truths enforced by history and biography into fixed and dependable modes of response, the considering of evidence, holding fast to points, evaluating premises, facts and conclusions, and actually thinking and expressing thought in conformity with the laws of thought and expression:—these and similar intellectual processes should be reduced to fixed habits. James' statement is scarcely exaggerated: over 99 per cent of our actions are purely automatic. To make the unvarying intellectual processes habitual is to free judgment for the problematic situations of life. In the field of motor habits (piano playing, writing, legerdemain, military drills, etc.) there is no other recourse than to practice, and the central element in practice is repetition. It would seem inherently probable that repetition is valuable not only in the field of motorization but also in the field of purely mental or intellectual automatisms.

[3] McMurry, How to Study and Teaching How to Study, 1909. Chapter VII.

3. Experiments indicate that frequency or repetition is one of the most important factors in recall—experiments by Calkins, Ebbinghaus, etc., which we cannot here detail.

4. In the average drill little if any effort has been made to appeal to the variety of mental imagery found in children. The drills have not been adapted to the differences in ideational type, hence the best results have not been obtained.

5. Too many drills have been characterized by an unvarying repetition of the same processes or problems, instead of requiring the child to apply the facts or principles gained to new instances or situations; hence the alleged stultification.

6. The average drill has been too formal in the sense that it has not been motivated or vitalized by being related to some dynamic purpose or vital need. By making the child clearly apprehend a relevant situation and feel his need for solving it the repetitions can be made dynamic.

7. Cornman's results, which seem conclusive and which certainly rest upon a painstaking enquiry, are subject to the following special objections:

a. The "list of spontaneously written words" and some of the "composition tests" enabled the pupils to select their own words. Naturally when a choice of words obtained for expressing the same thought in writing those most readily written, most easily spelled and most familiar would be selected. Obviously the child would at least shun those words which he knew he could not spell. Moreover, the vocabulary in such writings would be characterized by a paucity of words. But in life situations, in the conditions which confront the stenographer, reporter, etc., an arbitrary choice of words does not present itself. The validity of this criticism is indicated by the "column tests," which show a low percentage of efficiency and which contain unusual words, as compared with the other tests. In Rice's results the difference between the column lists (which did not permit any selection), and the sentence and composition tests is very striking: from 15 to 30 per cent.

b. This fact will partly account for the high percentage of correctly spelled words—unquestionably high—found by Corn-

man, which will render the results, to this extent, delusive. The following fact also partly accounts for the high grade of efficiency found.

c. The experimental series of incidental spelling involved a certain amount of *specific* spelling instruction or drill, in that words which were liable to be misspelled were placed conspicuously before the pupil when writing on topics in which they would probably occur. Besides the children were permitted to refer to the dictionary or the teacher when in doubt; and pains were taken also to anticipate mistakes.

d. What percentage of words not misspelled in the special test was studied before from the spelling books when the latter were in use? The answer to this question has a bearing upon the problem at issue.

e. It is also necessary to know what percentage of the words in the "superintendent's term examinations" had been previously studied in the regular spelling exercises. One of these examinations came five months after the abandonment of the spelling exercises, and two, one and two years, respectively, later. It is worthy of notice that the experimental classes do not show as good results in the two later examinations (a loss of 4.1 per cent for the primary classes). This would indicate that the superiority in the earlier examination was due, in part at least, to the residual effects of the previous special spelling exercises. The residual effects would naturally grow weaker after a lapse of a couple of years.

f. Pursued to their logical conclusion Dr. Cornman's results would convert systematic instruction and organized curricula into pedagogical monstrosities. If specific instruction or drill in spelling is valueless, why are they not a sheer waste in other branches as well? Accordingly why not do away with specific instruction or drill in the various subjects, and also the articulated curricula, which obtain in the schools at present? Leave all acquisition to merely incidental acquirement. Let the child get it in dragnet fashion; and let him effect his own concatenations and articulations between the various data of knowledge. The school would thus seem to offer but slight advantage over the

home, street, shop, or field, except that it might afford a richer wealth of material for such incidental acquisition. Cornman foresaw the logical inevitableness of this conclusion, and hastened to say that only the modes of expression arising inevitably and naturally should be left to incidental instruction. But that spelling does not thus arise seems to be the reproach of the old persons of our acquaintance who have not been schooled and whose spelling is anything but ideal. On this point Rice's results teach no uncertain lesson. The schools which had abandoned the spelling lessons for incidental spelling instruction gave poor results in the column test. The children spelled the simplest words in the most absurd fashion. And this indicates the weakness of the incidental method: not only does it not allow of a graded course in spelling ("from the simple to the complex") but it tends to neglect the common everyday words easily misspelled in its emphasis upon the unusual or technical words which occur in the other subjects, to which spelling is made an incident. Some time ago I observed children in a physiology class learning the following list of words from the board, which they were required to use in a composition they were writing: stomach, inanition, œsophagus, epigastrium, lymph, osmosis, ptyalism, autointoxication, saliva, bile, blood. They were taught spelling by the "natural method."

The average person does not pick up the school arts along the way; they must be acquired in the conscious attempt to realize a clear ideal or attain a well-recognized standard of excellence. Skill is not heightened by practicing beneath the level of one's best possibilities; and these possibilitites are approximated only as attention is focalized upon some pattern of possible attainment. This is particularly true of linguistic expression, which is more difficult than spelling, reading or numerical computation. The attempts of the "Harvard Committee on Composition" to limit composition to extemporaneous composition, and the "Committee of Ten" to displace formal language exercises by incidental language training, do not commend themselves because they are not in accord with the laws of habit formation, as will be seen presently. The recommendation of the "Committee of Fifteen,"

that both regular and incidental language exercises should be provided, is more in accord with the laws of mental growth.

g. Perhaps the chief criticism of these results, however, is that they do not constitute an indictment of the spelling *drill* proper, but rather of specific spelling *study* and instruction (which, moreover, the incidental nature of the work did not exclude), and cannot thus warrant the sweeping conclusion that the "spelling result is a function of the general pedagogical health of a class . . . a constant quantity altogether independent of the method of teaching," and particularly that there is no discoverable relation between the time spent on specific spelling drills and the results. For there certainly is a distinction between mere study and drill. What Cornman refers to as drill amounted simply to a certain number of minutes of study of a spelling lesson at school or at home, and to a given number of minutes set aside in the program for a spelling recitation—"a specific spelling lesson, taught, studied and recited in oral or written form." To educative processes of this nature it would be well, in the interest of clear thinking, to apply the word *study* (and reciting), and restrict the term *drill* to a process which is differentiated from mere study in various particulars. To be sure, both studying and drilling contain common elements; and yet, properly conceived, they are not synonymous processes. There are certain aspects of study which receive a distinctive emphasis in the drill.

8. My final reply, then, to the objections to the drill is that the alleged inefficiency of the drill is not inherent in the drill as such, but pertains to a brand of drill which, if it can be considered to merit this name at all, does not properly conform to the demands required of a genuine drill. If there is any weight to this criticism it must be possible to point out the criteria of a good drill. By what standards of excellence shall the effective drill be known?

Inasmuch as the central element in the drill is practice or repetition and its central aim is the production of a certain measure of automatism, it must be governed by the same factors which preside over the formation of habits. A good drill follows the law of habit formation. The effective formation of habits has been reduced to a law by psychologists, and is now well under-

stood. However variously stated, this law involves three fundamental elements or phases. If I set out to train the child to write, for example, I have as the goal of my endeavor the making of certain writing movements (lines, curves, forms) relatively automatic: writing is a *tool* that must be automatized in order to free attention for matters requiring judgment or thinking. My first concern then is to catch the child's attention and to concentrate it upon the process which I wish to mechanize. I do this by directing the child's attention verbally to what I want done. I show him the form which he is to imitate; I reproduce the form myself before his eyes, so that he obtains a visual-form image and a visual-motor image of the letter. I also induce him to trace himself the movements, which he has observed, and he thus derives a tactual-motor series of images of his own movements. By such expedients as these I succeed in getting the pupil to concentrate his attention upon the process to be made the subject of drill. The first element in all drill is thus the initial focalization of attention upon the process to be drilled upon. In too many drills no attempt is made to secure this initial focalization. The child is given no clear idea of what he is to do; there is no clear ideal or aim to guide and vitalize the process. And sometimes the tasks presented are so multiform that initial focalization is quite impossible.

Consequent upon the initial focalization, there must be *attentive* repetition. Our child must keep repeating his writing form after he has the image of it in mind. But merely mechanical or rote repetition will not suffice. If he keeps his attention upon the passing throngs outside of the window his repetitions will avail him little, so far as concerns automatizing the imitations of the form in question. Such repetitions will degenerate, and produce a copy which grows increasingly inferior to the model. It has been frequently noticed that as the reproductions approach the bottom of the copy page, or get farther and farther away from the model in space, they also grow more and more dissimilar. The quality of the attention has degenerated. In the average drill the child repeats without having his thoughts upon his work the results of the drill are consequently disappointing. But then

the conditions of the drill are not being supplied. The vital practical problem here becomes one of keeping the child's attention riveted upon his reiterated tasks.

Nor is this all: in the genuine drill the attentive repetitions must be continued until the stage of automatism has been reached, or at least closely approximated. If the child grows weary his efforts will count for little; they will yield a very meagre fruitage. The practice effects will vanish unless the neurone modifications have been thoroughly solidified and rendered stable or persistent. Our hereditary habits, or instincts, do not thus vanish because they rest upon a stable neural substrate. What has been found essential in the organization of racial habits can not be dispensed with in the formation of individual habits. The music teacher, prestidigitator, and drill master in the army, recognize the importance of this final element in habit formation. It is safe to say that in the average drill this final stage is never completely reached. Not only have the initial concentration and the attentive repetitions not been exacted, but the mechanization has not even been approximated. The child has been given so many words to learn to spell that no effective concentration has been possible; his desire for constant change and variety has been so condoned or coddled that there has not been even a semblance of attentive repetitions; and the meagreness of the results has been attributed to the drill, albeit the drill supplied none of the essential conditions of the drill technique.

It is with the latter thoughts in mind that I wish to refer, briefly, to a spelling drill which has been in use in the Cleveland schools during the last three years, and which supplies, in a measure, some of the requirements of the drill as properly conceived.[4]

First, as affects initial concentration. Instead of dispersing the child's attention over twenty, thirty or forty new words each day, the plan requires *intensive focalization* upon *two new words* only (eight other subordinate or review words are a part of each day's lesson). These two new words are rendered conspicuous typographically: they are printed prominently in large type at

[4] This drill is the fruit of the labors of Asst. Supt. W. E. Hicks, of the Cleveland Schools. Cf. Hicks, Champion Spelling Book, American Book Co., 1909.

the head of each day's lesson, thus attracting attention through the laws of primary passive attention. With these two prominent words as points of departure the child is required to construct sentences of his own. This not only makes for continued focalization of consciousness upon the new words to be mastered, but requires the application of the words in the only way in which spelling becomes a matter of moment in the workaday affairs of life—in a connected series of words or written composition.[5] Before thus using the words the pupil is required to ascertain their meanings where doubt exists, and this tends further to converge attention upon the word. During the course of a week ten dominant words have thus received concentrated attack. The conditions of initial concentration have thereby been supplied.

Second, *attentive repetition* is insured in this plan by a scheme of systematic drills and reviews. These are secured by having the prominent words focalized during the week recur during the course of the next two weeks among the subordinate words; by making them the subject of special review once a week; by providing oral and written interschool contests at the end of every eighth week, based upon the 80 words focalized and reviewed during this period; by providing similar annual contests; and by taking the words up again as subordinate words during the following year. Each focalized word is thus reviewed five times within two years. To vitalize the process and secure attentive repetitions recourse is had to these interschool and interclass contests. The contests are held between all the schools of the same grade in the system. The names of the schools are conspicously bulletined in the press and in special circulars in the order of excellence. The child's attention is motivated by appealing to his instincts of emulation, rivalry, and pride in the superior excellence of his class and school.

[5] A stock objection to the spelling drill is that efficiency in spelling *word lists* does not transfer to *connected composition*—the familiar objection to the doctrine of formal discipline. I am at present making certain investigations on this and other aspects of the spelling drill, the results of which will be embodied in future articles on The Psychology and Pedagogy of Memorizing and Drilling, and A Test of the Transfer of Spelling Ability Acquired in Column Drills to Dictated Compositions.

Third, the focalization and repeated reviews already described should have resulted in a fairly high degree of automatic mastery of the spelling of somewhat less than 2000 focalized words during a period of six elementary school years (more words are included in the Spelling Book, but they have not been subjected to this thoroughgoing drill process). I propose in what follows to refer briefly to the results of tests which evince improvement in spelling in the Cleveland schools since this spelling drill, which supplies in fair measure the conditions of the genuine drill, was introduced.

In the first interschool spelling contest the pupils of the eighth grade averaged 1.5 words per pupil incorrectly spelled in a total of 120 words. In the corresponding test one year later, 1907, or one year after the introduction of the drill described above,the average number of errors per child was only .483 of a word. In 1908 a test, embracing 50 words, given by a specially appointed educational commission in 1905 (consisting of Presidents Howe and Thwing, and Professor Avery), was repeated with all the pupils of the city in the same grade. In the 1908 test the average number of misspelled words per child was three, as against thirteen in 1905. The spelling efficiency had increased from 74 to 94 per cent. Similarly, a test given in Chicago was repeated in 72 eighth grades, giving an *average* spelling efficiency of 84.17 per cent. This figure attains its significance in view of the fact that 84 per cent was the record of the *best* individual eighth grade in Chicago, while a slightly higher percentage was the average of the 72 in Cleveland. Better known is the 1908 N. E. A. Spelling Contest, in which Cleveland scored the highest success. The contest was based upon the Lord-Baylor--Brown-Stone list of words. In this Cleveland totaled 40 errors, while Pittsburg totaled 47, New Orleans 66 and Erie 85. The following year a spelling test given in Cleveland in 1858 was repeated, with the result that the average was one misspelled word less per pupil than in 1858. In one of the early tests of 1909, given to the pupils of the seventh grade of two schools, composed largely of Jewish children, out of 12,800 possible mistakes only "one boy in each school made one error." In the annual contest of May,

1909, the spelling proficiency in the fifth grade reached 95 per cent; in the sixth grade, 96 per cent; in the seventh 97.16 per cent and in the eighth, 97.2, or a general average for these grades of 96.34 per cent.

In the eighth-week contest in November 1909, 21,290 of 35,098 pupils in the various grades gave perfect returns in both the oral and written contests, and the average was 1.235 incorrectly spelled words for each pupil in both tests.

In the corresponding contests in January, 1910, 17,127 of the 33,364 pupils spelled all the words correctly, and the average number of errors per pupil was 1.698.

In the oral contests of last March in which 33,928 pupils in the third to the eighth grades inclusive partook, the number of misspellings was 9,971. The total number of possible chances to misspell was 6,785,600, or, since each pupil spelled only five words, 169,640. This gives an average efficiency of about 94 per cent, which is quite satisfactory in view of the conditions: each pupil received only five chances to spell from a list of 200 words. Perfect grades were obtained by 5,377 pupils. In the written test, on the other hand, in which was included homonyms on which there had been no systematic instruction or drill, the efficiency dropped to 89.6 per cent.

Here we have a degree of efficiency produced by the application of certain fundamental elements of the drill that is impressive. Certain facts will add emphasis to this impressiveness. The spelling contests in Cleveland are conducted under rather rigorous conditions: i's not dotted and capitals not properly used count as mistakes; the written work must be corrected by two teachers; a second teacher must keep the record in the oral contests. Furthermore, the spelling drills in the elementary schools of Cleveland consume only 5.96 per cent of the available time, as compared with 7.22 per cent, which is the average for a number of the leading cities of the country. Moreover, these results present a striking contrast to the results of Rice's column and sentence tests for 16,000 children in twenty-one cities of the country.[6] Here the spelling

[6] These tests, repeated in Philadelphia, gave similar results.

efficiency ranged from 53.5 per cent, in the fourth grade, to 84.4 per cent, in the eighth grade. In another test carried out by Rice himself the averages for entire buildings ranged from 73.3 to 77.9 per cent. Only in the case of fifteen schools for the *eighth* grade did the results approximate to any degree perfect scores. This was in the case of a composition test which did not seem to be sufficiently difficult to set any problem to pupils of their attainments. The words used in the Cleveland tests differ for the various grades, and many of them are difficult words. In fact, the lists are compiled from words submitted by the teachers as most frequently misspelled.

It is by no means evident that modern pedagogy demands the substitution of incidental spelling instruction for the spelling drill. It is still less evident that the schools have outgrown the drill in the other formal branches of the curriculum. To my mind, it is no more a question of drill or no drill. It is a question of a pedagogically adequate drill, as against a slipshod, happy-go-lucky drill. It is a question of evolving and economically using a psychologically justifiable drill technique. This aside, the attempt to solve questions of teaching method solely by appeal to opinion will prove about as futile in future as it has done in the past. At best, such opinion is valuable merely as furnishing starting points, as setting problems, and as checking or confirming results otherwise obtained. Opinions from the actual classroom craftsmen will always be valuable, but they are not the final court of appeal. Eventually questions of this sort will be settled by the method of controlled experimentation, just as questions in medicine, hygiene and diatetics are no longer settled by the *opinions* of physicians, but are now being decided in the laboratory. It is the function of the new science of experimental pedagogy to evolve an experimental technique adequate to the solution of pedagogical questions. Just as mooted points in psychology are now, to a great extent, referred to the psychological laboratory as a matter of course, so in some not distant day mooted questions in pedagogy will be referred as a matter of course to the pedagogical laboratory or the experimental school. The ordinary tests, carried out in random fashion in schools where no

specific methods have been followed and where no control of conditions has obtained, must yield results of doubtful validity. It is because uniformity and a fairly high degree of control of conditions have marked the spelling work in Cleveland that I have ventured to use these results as the basis for this paper and to contrast them with results of tests obtained elsewhere.

In a recent editorial the *New York Times* presented the following exercise in support of its contention that the passing mark for promotion in the grades should be raised to 90 per cent. "Here is a specimen of the scholarship of a boy 15 years old, American born and bred, who has been promoted to the grade of 8A, the highest but one in the city's grammar schools:

DICTATION.

They attenmed no raush gast, therefor, at that stage of the prublem. "Boys also out teacher said," like to have it," Thought, when it get into a boy poctey, I believed it is oftened say to burned a hold there. Instinly twelty out strech hand indecake an Idle demaning utterans in twelty head "If you pleas "sir" I know what it is" "Well, what is it?" "a pice of cold?"

"Here is the passage "corrected," the teacher spelling out each word dictated, the pupil writing his version of the spelled-out dictation:

They attented no rash gess. therefore at that stage of the problem. "Boys also our "teacher said" like to have it," thought when it get into a boy potet. I believe it is often said to bruned a hold there; Instanley twelty outstretch hand indicate an idle "If you pleas sir' "I know what it is" "Well what is it" "A pice of cold?

"The key to the passage follows:

They attempted no rash guess, therefore, at that stage of the problem. "Boys, also," our teacher said, "like to have it, though when it gets into a boy's pocket, I believe it is often said to burn a hole there." Instantly twenty outstretched hands indicated an idea demanding utterance in twenty heads. "If you please, Sir, I know what it is." "Well, what is it?" "A piece of coal."

"The samples presented above, together with some others by older boys, that display not much greater proficiency, are submitted to *The Times*, in manuscript, as typical of work done in the 8A grade by not less than one out of every eight pupils in Greater New York."

ABSTRACTS AND REVIEWS

A. VON SYBEL. *Ueber das Zusammenwirken verschiedener Sinnesgebiete bei Gedächtnisleistungen.* (Zeitschrift für Psychologie, 53: N. 4 u. 5, 1909, 257-367.)

This monograph reports the results of a very elaborate series of experiments undertaken to determine the way in which the various sense-departments cooperate in memorizing nonsense-syllables. The three types of sensation that may function in such work are, obviously, the visual, the acoustic, and the kinaesthetic. It is possible to utilize any one of these alone (or, better, to emphasize the activity of any one, and minimise that of the others); or any two or all three may be combined in various ways. The object of the experiment was to determine the combinations that were most favorable to economy of learning. The following combinations were tested:

1. *The visual-motor-auditory series.* In this series, the observer read the syllables (which were exposed upon the revolving drum of the kymograph), and simultaneously pronounced them aloud, taking care to speak very distinctly.

2. *The visual-motor series.* The observer read the syllables and articulated them without sounding them.

3. *The visual series* (*a*). The observer read the syllables visually, inhibiting as completely as possible all speech-movements. (At first this condition was fulfilled by holding the tongue between the teeth, but this introduced a distracting element too serious to be overlooked; in the later tests, the observer was simply instructed to inhibit as much as possible.)

4. *The visual series* (*b*). The observer was permitted to employ any motor reaction that he wished, so long as it was constant throughout the test, and so long as it did not involve speaking aloud.

efficiency ranged from 53.5 per cent, in the fourth grade, to 84.4 per cent, in the eighth grade. In another test carried out by Rice himself the averages for entire buildings ranged from 73.3 to

efficiency ranged from 55.9 per cent, in the fourth grade, to 84.4 per cent, in the eighth grade. In another test carried out by Rice himself the averages for entire buildings ranged from 73.3 to 77.9 per cent. Only in the case of fifteen schools for the *eighth* grade did the results approximate to any degree perfect scores. This was in the case of a composition test which did not seem to be sufficiently difficult to set any problem to pupils of their attainments. The words used in the Cleveland tests differ for the various grades, and many of them are difficult words. In fact, the lists are compiled from words submitted by the teachers as most frequently misspelled.

It is by no means evident that modern pedagogy demands the substitution of incidental spelling instruction for the spelling drill. It is still less evident that the schools have outgrown the drill in the other formal branches of the curriculum. To my mind, it is no more a question of drill or no drill. It is a question of a pedagogically adequate drill, as against a slipshod, happy-go-lucky drill. It is a question of evolving and economically using a psychologically justifiable drill technique. This aside, the attempt to solve questions of teaching method solely by appeal to opinion will prove about as futile in future as it has done in the past. At best, such opinion is valuable merely as furnishing starting points, as setting problems, and as checking or confirming results otherwise obtained. Opinions from the actual classroom craftsmen will always be valuable, but they are not the final court of appeal. Eventually questions of this sort will be settled by the method of controlled experimentation, just as questions in medicine, hygiene and diatetics are no longer settled by the *opinions* of physicians, but are now being decided in the laboratory. It is the function of the new science of experimental pedagogy to evolve an experimental technique adequate to the solution of pedagogical questions. Just as mooted points in psychology are now, to a great extent, referred to the psychological laboratory as a matter of course, so in some not distant day mooted questions in pedagogy will be referred as a matter of course to the pedagogical laboratory or the experimental school. The ordinary tests, carried out in random fashion in schools where no

ABSTRACTS AND REVIEWS

A. VON SYBEL. *Ueber das Zusammenwirken verschiedener Sinnesgebiete bei Gedächtnisleistungen.* (Zeitschrift für Psychologie, 53: N. 4 u. 5, 1909, 257-367.)

This monograph reports the results of a very elaborate series of experiments undertaken to determine the way in which the various sense-departments cooperate in memorizing nonsense-syllables. The three types of sensation that may function in such work are, obviously, the visual, the acoustic, and the kinaesthetic. It is possible to utilize any one of these alone (or, better, to emphasize the activity of any one, and minimise that of the others); or any two or all three may be combined in various ways. The object of the experiment was to determine the combinations that were most favorable to economy of learning. The following combinations were tested:

1. *The visual-motor-auditory series.* In this series, the observer read the syllables (which were exposed upon the revolving drum of the kymograph), and simultaneously pronounced them aloud, taking care to speak very distinctly.

2. *The visual-motor series.* The observer read the syllables and articulated them without sounding them.

3. *The visual series* (*a*). The observer read the syllables visually, inhibiting as completely as possible all speech-movements. (At first this condition was fulfilled by holding the tongue between the teeth, but this introduced a distracting element too serious to be overlooked; in the later tests, the observer was simply instructed to inhibit as much as possible.)

4. *The visual series* (*b*). The observer was permitted to employ any motor reaction that he wished, so long as it was constant throughout the test, and so long as it did not involve speaking aloud.

5. *The visual-auditory series.* In this the observer read inaudibly but, simultaneously with his reading, each syllable was pronounced by the experimenter. It was left to the observer whether he would direct his attention more to the acoustic than to the visual stimulus. The motor reaction was also a matter of choice with the observer, except that

he was not permitted to pronounce the syllables audibly, nor to vary his motor response.

6. *The auditory series.* In the experiment with acoustic stimuli the experimenter read the syllables from the kymograph, while the observer listened passively. In the reading, accenting was avoided, but the experimenter dropped his voice slightly at the middle and at the end of each series. The motor attitude of the observer was determined as in the visual auditory series.

With unimportant exceptions, the stimulus series were of the normal twelve-syllabled type. The revolution-time of the drum was arranged for each observer according to the degree of his practice and of his motor readiness, except that the time was always as brief as possible. Sybel employed in his experiments a combination of the "learning method," and "the scoring method" (*Erlernungsmethode* and *Treffermethode*). The test for the latter method occurred usually after five minutes' work on the series. Careful introspective records were kept by the fourteen observers throughout the experiment. The observers' memory-types were first determined, and the classification of the results is upon this basis. For purposes of comparison, a series of tests was made with meaningful materials, selections from Tasso's "Jerusalem Delivered" being employed for this purpose.

From the mass of data thus collected, Sybel draws a number of conclusions. Many of these are of interest chiefly to those who are working in the field of memory-experimentation. Others, however, are significant to educational psychology, and among these the following are, perhaps, the most significant:

1. In general, reading aloud is more favorable to rapidity of learning than is silent reading. The advantage of reading aloud is the greater the more rapid the tempo, and the more marked the motor tendency of the learner. The number of right associations (the test of the "scoring method") is almost always greater in the visual series than in the visual-motor-auditory series. The difference in favor of the visual series in this respect is the greater the more rapid the tempo.

2. Adding the acoustic element to the visual (as in the visual-acoustic series) increases the rapidity of learning. The number of right associations, however, is higher in the visual series.

3. Adding the articulatory element to the visual decreases the number of repetitions necessary to learning and this is true for the sensory type of observer as well as for the motor type; but, as a rule, it also lessens the number of right associations.

4. In the acoustic series, the addition of the articulatory factor shows a smaller influence on the number of repetitions essential to learning than is the case when the articulatory factor is added to the visual.

5. Contrary to expectation, the auditory series required, even with visual observers, fewer repetitions than the visual series (assuming like motor tendencies).

6. Deviations from Ephrussi's law (which asserts the direct dependence of learning-time upon rapidity of reading) appear in the visual-motor series more clearly than in the visual-motor-auditory series; while in the visual series, learning is interfered with in a marked degree by rapid reading.

7. In general, the results of the tests on the learning of meaningful materials, in so far as the repetition-values are concerned, run parallel with the results for the nonsense-materials.

8. With regard to the superiority of the visual-motor-auditory series, it would seem that the regular recurrence of the sound-stimuli and the necessity for articulating the syllables are the important conditioning factors. They form, as Sybel expresses it, a "discipline for the attention." The sharp external sound stimulus seems also to favor a more effective acoustic association than is possible otherwise. Articulating the separate syllables similarly encourages kinæsthetic associations, and also brings with it a more precise apprehension of the syllable, particularly in respect of the consonantal values.

9. On the other hand, the learner who is strongly sensory in type may be distracted by the sound of his own voice, and by the necessity for articulating.

10. In connection with the auditory series, many observers found it necessary to visualize the word as spelled, a process which quite naturally lessens the rapidity of learning.

W. C. B.

GEORGE HERBERT BETTS, Ph.D. *The Distribution and Functions of Mental Imagery.* Teachers College, Columbia University, Contributions to Education, No. 26. (New York: Teachers College, 1909. Pp. 99.)

This book contains an account of 16 experiments conducted upon students at Cornell College and at Teachers College upon voluntary and spontaneous imagery (verbal imagery being expressly excluded from consideration.) The conclusions may be summed up in the following

propositions: (1) Most persons have a wider range of imagery at their command than they normally employ in thinking. (2) Imagery tends to appear in consciousness, either (*a*) when our thinking is baffled, or (*b*) when perceptual content would be of obvious value. (3) Thinking not only can, but usually does go on without the intervention of imagery, and when imagery is present in the background it is often not essential to meaning. Meanings of a logical sort (relational experiences), in particular, are not images and are not dependent on images. (4) Such mental activities as discrimination, memory (recall), and the appreciation and enjoyment of literature can, similarly, go on without imagery and such imagery as appears may be incidental, if not positively disadvantageous. Thus, the 'memory image,' as a general term for all memory stuff is a fiction.

To reach these conclusions, Betts employed for voluntary imagery a questionary which may be regarded as an extension of those of Galton, Titchener, and Thorndike, and for spontaneous imagery both what he terms the "method of interrupted thinking," and simple introspection of typical mental activities, *e. g.*, of mental multiplication, free association, selective thinking, simple logical processes, recall, interpreting music, etc. We note that the term discrimination (of pitches, grays, etc.) is applied to a process of identification from memory which is rather far removed from a process of discrimination.

In all this work the so-called introspection is evidently on the amateurish level. It is mere description, not analysis, and the general scheme of the work is that of compiling, averaging, correlating and otherwise subjecting to statistical treatment a mass of second-grade introspective material. We doubt whether the function of the image can be determined by such a method.

One questionable point of technique is the use of a "guide to introspection" (p. 52), which is given to students "to help train introspection." Our experience has been that such a guide should be built up after, and on the basis of, preliminary introspective reports. If it is given to the observer outright at first, it can scarcely fail to govern and control the introspection to an unwarrantable degree.

Speaking of technique, again, it may be doubted whether Betts' elaboration of the questionary has enabled him to avoid the "loose and general answers" which he says characterize returns to the Titchener questionary—a piece of work which he considers "far below this author's usual high demands for scientific accuracy." To which it might be replied that the limitations of this questionary have been clearly pointed

out by Titchener in his Instructor's Manual as well as in other places (*e. g.*, Jour. Phil., Psych. & Sci. Meth., 1: 1904, p. 39).

In several places, the writer implies that since, under specified conditions, a given type of imagery can be absent from the minds of a number of persons, its presence in the minds of others under the same conditions is accidental and contributes nothing essential to the thought-process in question. This is, of course, a treacherous generalization, as numerous illustrations in the literature of the experimental psychology of thought will show.

In general, we miss in this book an appreciation of the real problem involved. There is no evidence that Betts is familiar with the contributions of Bagley, Bovet, Messer, Sidgwick, and Segal, or of Washburn, Bell and Mückenhaupt, to mention only a few of those who have attacked the problem of the image and its relations to the thought-processes.

G. M. W.

EDWIN A. KIRKPATRICK, Ph.M., Editor. *Studies in Development and Learning.* Contributions from the Department of Psychology and Child Study in the Fitchburg Normal School made by the Advanced Class of 1907. Archives of Psychology, No. 12, March, 1909. (New York: The Science Press. Pp. v + 101.)

Professor Kirkpatrick has given us here in brief form the important conclusions, with tables, curves and enough data to justify the conclusions, of the theses presented for graduation of one of his recent advanced classes. While seventeen titles are given, but fourteen theses are summarized. These are distributed through a number of fields of prime interest to psychologists and teachers of today, including physical tests and measurements, development of auditory and visual memory, development of quickness of perception and movements, of the artistic sense, of penmanship, the curve of learning, fatigue in habit formation, ways of learning visual forms, how children study, musical learning, and a few other topics.

Except in minor details, the conclusions presented are but verifications of well established principles. To most of the discussions the editor has prefixed an explanatory note as to methods, conditions, etc., and has added a final paragraph calling attention to the more significant results. The practice in the Fitchburg Normal School of keeping continuous records of all the pupils in their training school throughout

their entire attendance on the school has accumulated a mass of data which yield much more significant comparisons for different ages than data collected from children of different ages at the same time. In this respect some of the studies are unique.

On the whole the work of the students contributing the studies has been well done. It certainly compares favorably with similar work of undergraduates in our best colleges. While in some instances the limited experience of the authors leads them into an over-emphasis of the commonplace, in other cases commendable discrimination is shown. In the longest and, in most respects, the best study of the group on "The Curve of Learning," Miss Munn has introduced a variety of conditions and a variety of subjects which cover the field very satisfactorily in an elementary way.

The chief service of these studies to education, it may be predicted, will be in their suggestions as to simple and valuable investigations in the closely related fields of experimental pedagogy and practical child study. I know of no single volume which contains so much of practical utility for the normal school department of education seeking to develop the experimental side of the work without the use of apparatus.

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GERTRUD BÄUMER and LILI DROESCHER. (Compilers of) *Von der Kindesseele: Beiträge zur Kinderpsychologie aus Dichtung und Biographie.* (Leipzig: R. Voigtländer, 1908. Pp. 428. Mk. 6.)

The compilers of this book have collected from the works of some 60 authors, mostly German, passages that bear upon child life. Extracts appear from Björnson, v. Bülow, Darwin, Freytag, Gorki, Lichtenberger, Richter, Carl Schurz, Tolstoi and other well-known writers. The selections are grouped to accord approximately with the development of the child's mental life, under such headings as earliest impressions, discovery of the world, first attempts at speech, children's letters, childish joy and sorrow, love of nature, fears, views of death, dreams, play and playthings, the theology of childhood, religious instruction, dishonesties, jealousy, self-control, the home life, social education, friendships, school life, etc. The use of the book is facilitated by an index of subject-matter and an index of authors.

Such a collection is surely useful, particularly on account of the use made of biographical material. The English reader will regret to find that German script has been employed.

G. M. W.

LAURA L. PLAISTED. *The Early Education of Children.* (Oxford. Clarendon Press, 1908. Pp. xiv + 398. $1.50).

This is a book of a type much needed. An experienced school administrator has evidently kept herself carefully in touch with the actual teaching of children and at the same time has been in close communication with parents, physicians, and other teachers. She has not been unacquainted with, nor afraid of the experience found in the history of education and she can use ideas found in America without feeling called upon to denounce English conditions and customs.

A straightforward statement of actual work from such a source cannot fail to have value, whether the reader believes in the practice or not. The English infant school is oftentimes a discouraging institution; there is in many cases little besides mechanism and that mechanism is at times so effective in turning out the formal results sanctioned by habit that its most earnest critics almost despair of reasonable progress in reconstruction. One of the most successful directors showed me marvelous formal work on the part of children of five to eight and then said: "But it is not worth while. These children are no better off in formal work at ten or twelve than others who have escaped this grind and they lack the background of concrete experience which means most for the later years."

Miss Plaisted has knowledge of things as they are and goes ahead in pragmatic fashion doing the best that is in sight. There is clear evidence of a desire to conserve the older English interest in physical welfare and games as well as the best elements of the Pestalozzian influences which in their less free aspects so long were potent in English primary education. The Herbartian wave has left its imprint, perhaps less worked over than the other forces. The most striking influence is that of Froebel—a much more recent factor in England than in America. The Americans who have entered into this synthesis are most notably Dr. Harris and Miss Blow. Acquaintance with the Washington schools is shown and the influence of Miss Bentley of that city on the music is evident. It seems strange not to find acquaintance with the work of Teachers College at Columbia or the School of Education at Chicago. There is a next step which, whether the author approves of it or not, needs to be known and

evaluated in giving a book of this kind greatest effectiveness. This is perhaps best seen in this country in the work of Professor Dewey and in England in that of Professor Findlay in the Demonstration Schools of the University of Manchester. The transition of the latter from the Herbartian influence to that of Professor Dewey marks an assimiliation of Herbartianism missing here.

It is possible that the practical service of the work in meeting present needs in England may be greater than it would be were the statement more complete on the experimental side. The material is in two sections—the first of 102 pages is for The Child Under Five, the remainder of the book is concerned with the ages five to seven. There is an appendix on The Medical Responsibilities of the School Teacher, by Dr. A. L. Ormerod, medical examiner in the city of Oxford, which is a sensible statement of facts teachers ought to have at hand regarding diseases, defects, the hygiene of sleep, food, clothing, etc. There is evident throughout the book greater familiarity with official reports on education than is common with our principals and teachers.

A clear conception of the necessity of experience as a basis for any formulation in the three R's, etc. and the fallacy of real growth without initiative and leisure is seen. There is no danger that in this school a boy's time would be so filled as to give him no room for choice and responbility.

The writer is very sensible in her use of the persons she has chosen to follow. Froebel's work is seen as a unifying force of especial value to less trained teachers. She may be over sanguine concerning the value of Froebel's songs, but it is clear that as soon as she is convinced of better material that can be used by ordinary people, the old will go. Miss Blow is used freely; there is no evidence of antagonism, although the mixture of Froebelian material with that from other sources would grieve that lady seriously. Old devices linger as the use of "central thoughts" like the following, for the work with children under five,—"The wonder and infinity of the works of the Creator." The process of learning to read as here stated must seem over complicated to a young teacher, although there is a sensible attitude toward the various methods in use. It would be easy to find flaws, but on the whole there is so much good sense in the accumulation of material, the balancing between old ways of doing and short cuts, between the ways of necessity and leisure, that one would trust the school with a child and would recommend the book to students of real situations.

FRANK A. MANNY.

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FRED LEWIS PATTEE. *Elements of Religious Pedagogy: A Course in Sunday School Teacher-training.* (New York: Eaton & Mains, 1909. Pp. 224. 75c.) (Approved as an advanced standard course by the committee on education. International Sunday School Association).

This book contains thirty-four chapters divided among three parts on child study, some elements of psychology, and the art of teaching, respectively, and includes a reference list for supplementary reading on these fields and on the Sunday school. Written in a readable style, it seems calculated to reach and benefit mainly readers who have had no professional training for teaching and no advanced general education; in the three fields covered, a general though fragmentary survey is given in the different chapters, with more or less constant application to the problems of the Sunday school. But such pertinence to the main issue is rather incidental and indirect in Part II, and throughout the book there is much general material that could have been omitted if readers were supposed to have any general knowledge in these fields. Recalling the average Sunday school, poorly organized, without educational supervision, dependent on voluntary and too often superficial teaching, its whole educational process out of touch with the pupils' needs and the modern educational world, the critic may judge that a book aiming to raise the efficiency of workers in this field must not be "too good for human nature's daily food." It is to its credit that it utilizes some of the best recent material in the way of expert educational theory, though there is some intermixture with views more dubious and antiquated.

The author insists that the pupil and his needs must be the starting point and center of the whole work of the Sunday school; he dwells on the different stages of development and their leading characteristics; he would enrich and adapt the curriculum; he believes in the value to the teacher of even a rudimentary knowledge of psychology; he magnifies the importance of habit forming in education; he emphasizes the importance of the teacher's intelligent preparation of lessons, of the dominance in the lesson of a clear aim and a central thought, and of procedure according to the traditional principles of method. To the reviewer, chapters 1, 6, 12, 25, 26, and 31 are among the most fruitful and are most free from confusion and dubious doctrines.

There is a partial dependence on authorities not today accounted experts, and too often the material has not been assimilated and organized by a careful analysis of the fundamental and technical problems at

issue. It may be too much to expect a technical mastery of the field in a book written with such a purpose, but for want of it the reader is sure at times to be led astray or to be confused. To be sure, the volume omits most moot points, and eliminates all discussion; but an implicit belief in the views presented can result in clarity only in case the views themselves are consistent. In the present state of our knowledge of genetic psychology, it is not remarkable that in the book at hand there is considerable confusion between different stages of development. Habit is frequently spoken of as the aim of education without reference to the distinction of stages, without an adequate concept of habit, and without notice of the limitations of the Sunday school. The motor factor is given a great place in the Sunday school, but one discovers that this implies an extension of that school and its closer correlation with the various week-day activities, or preparation for doing and imaginative doing are substituted for the real doing. The Sunday school teacher is committed to the five steps of the Herbartian method *in toto* at first, with stress on the value of induction and no mention of deduction. But the rigid formalism thus suggested, and so out of the question in the half hour of the Sunday school, quite disappears before the author's free and easy way of conceiving it. But this part of the book contains plenty of practical suggestions on the process and art of teaching, suggestions not without some basis in psychology; and it might be said that method on a logical basis is less vital to the needs of the Sunday school. Indeed the assumption of one, in apparently adopting the Herbartian method, that religion, morals, art and science are all to be taught by the same invariable or uniform method, is open to grave question. Finally, it might rightly be asked of a book on religious pedagogy that it give more attention to the philosophy and psychology of religion in order to present a conception of religion and of the mode of religious development. This side of the subject is not given the same prominence as are the general psychology and pedagogy. The fusion of religion with life is emphasized, but religion comes near to being identified with morality, and morality with habit.

E. L. NORTON.

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ANNA LOUISE STRONG. *The Psychology of Prayer.* (Chicago: University of Chicago Press. Pp. 122. 83c.).

In her booklet of seven sections the author maintains her theory of prayer as a form of the imaginative social process. It has for its end the construction of a wider self. Many of the so-called objective results of prayer are attained indirectly through the construction of a more confident self, through a better interpretation of the circumstances involved, or through subconscious activities in a variety of forms. Prayers for the sick have a therapeutic effect.

In this imaginative social process there arise simultaneously in consciousness two selves—the self of the me which represents a desire, and the self of the *alter* which represents the means of gratifying that desire. In the practice of this social relation between the me and the *alter* there are two tendencies—the æsthetic or contemplative, and the ethical or the practical. The former rests content in the emotional appreciation of the prayer experience itself, while the latter passes as soon as possible into action. The æsthetic form of prayer obtains its end by a surrender of the immediate desire, which results in peace of mind through a reliance on subconscious activities. In the ethical type of prayer the notion of a mighty helper, the unification of purpose, the dependence upon the more regularly efficient subconscious activities are important factors in reaching the desired end.

The question of the reality behind the *alter*, as also the question of the nature of the reality behind the me are problems for metaphysics and not for psychology. Both the *alter* and the me are real as contributing to the final result. Consciousness furnishes materials for an attempt to unify both selves. Some sort of dynamic unity is to be found in the me and in the *alter* since both originate in consciousness.

The author shows an intimate and a wide acquaintance with the prayer literature. Her treatment of the subject is, however, suggestive rather than exhaustive. It will prove a helpful contribution to a further study.

KARL STOLZ.

University of Iowa.

S. Weir Mitchell. *Motor Ataxia From Emotion.* (Journal of Nervous and Mental Diseases, May, 1909.)

Illustrating by a case of motor ataxia, Dr. Mitchell calls attention to the fact that many people experience a nervousness or peculiar motor ataxia when acting under observation. The act of signature, for example, is very often affected. He is surprised to find, upon inquiry "how many people there are who dislike to be under observation when signing a name." In older people this may, he thinks, be partly explained by the sense of failing powers. Others are perhaps hampered by the existence of a doubt, and the influence of emotion.

It seems to the reviewer that this subject has a close relation to childhood activities also, especially when accessory muscles are concerned. Are not children bothered and discouraged by the too close watching of adults?

Walter R. Miles.

University of Iowa.

J. Gonin. *Un cas d'aphasie visuelle pure.* Archives de Psychologie, 9: October, 1909, 51–62.

A five-year old girl who had been struck repeatedly over the head with an axe-handle suffered total unconsciousness for 48 hours and for three days after recovery of consciousness exhibited Jacksonian epilepsy in the left arm, together with other signs of nervous disorder. The epileptic seizures yielded to medical treatment, but the child's gait remained for a time ataxic, and she was judged by the physicians who first treated her to be cortically blind, because, although the retina was in normal condition, she was unable to name any objects set before her.

More careful examination by Gonin showed that the child suffered from left hemianopsia coupled with pure visual aphasia. If an object was presented upon the proper side of the visual field, she refused to name it or named it incorrectly, but if she were then given a series of names, one of which was correct, she invariably picked out the correct name and applied it to the object. The ability to name objects gradually improved and became virtually normal in a few weeks. Gonin suggests that cases may have occurred before in which a similarly mistaken diagnosis of blindness may have been due to visual aphasia.

The association of left hemianopsia with disturbance of the speech center is unusual: presumably here it was due to two-fold cortical injury, *i. e.*, of the right visual and of the left speech center.

John Francis.

PROFESSOR DR. BUCHHOLZ. *Zeugenaussagen.* Archiv f. Kriminal-Anthropologie u. Kriminalistik, **35**: October, 1909, 128–9.

The writer narrates briefly two incidents that illustrate the ease with which absolutely erroneous reports may be made with positive assurance of accuracy by a supposedly competent observer. In the first instance, the writer's 6-year old son, upon returning from a walk with his grandmother, said that while his grandmother was talking with another lady, his uncle had shaken hands with him and sent his regards to his mother. The child's grandmother emphatically denied that any such occurrence had taken place, asserted that she had not talked with anybody, that she had held the boy's hand all the time. and that they had not met his uncle. While the family was discussing the fallacies of children's testimony, the uncle appeared, corroborated the lad's story, and the grandmother, when the name was mentioned, recalled having spoken "for just a moment" with a lady friend.

In the second instance, the writer arranged to have a certain person simulate an attack of epilepsy before one of his classes. The person in question had thrown his jacket into a corner of the room, so the writer, during the simulated attack, picked it up and placed it under the supposed epileptic's head. After the 'demonstration' had been concluded, a student explained that *he* had foreseen the possibility of injury and had accordingly put the jacket under the epileptic's head. It required the united efforts of Professor Buchholz and other members of the class to convince the student that he had not really performed the act.

G. M. W.

CHARLES F. WINBIGLER, Ph.M. *Suggestion: Its Law and Appl cation, or The Principle and Practice of Psycho-therapeutics.* (Washington, D. C.: Spencer A. Lewis Company, 1909.)

The scientific reader will sufficiently understand the character of this book when he is told that the only authorities to whom the author acknowledges indebtedness are Tuckey, Schofield, Grasset, Bramwell, Leavitt, Thomas J. Hudson, Quackenbos and W. W. Atkinson,—a list curiously compounded of good and bad, but most surprising in its omissions.

The author says his desire has been to be of service to his day and generation. Granted. And if the desire were enough to warrant the publication of such a book, nothing further need be said by the present reviewer. We need not raise the question whether the author has rendered any service to his day and generation by writing this book, but we should like to head off some of the evil he has done. Such a mixture of half truths, truths and unfounded statements can only confuse or lead astray the unscientific reader.

To begin with, the author has become a convert to the belief in telepathy which has recently gained a seemingly imposing array of adherents —men whose names are famous in *some* lines and who, on this account, are supposed to be final oracles in every line that they happen to turn to, that old and familiar fallacy understood by school boys at least ever since the days of Whately. Telepathy has not been proved (to say the least), yet our author in blissful peace assumes that telepathy is an established scientific fact and bases everything upon it.

The sub-conscious mind has, it is true, somewhat better sponsors among men of science, but even those who have made most use of this concept would never subscribe to the crass views of the unconscious mind set forth by our author.

The old saw that "Whom the gods would destroy, they first make mad" may be finished by the equally true sentiment: Whom they would make mad they first interest in the occult.

It tempts one to believe in the soul-evolution theory, when he sees how most of the men who attempt to deal with the "occult" climb down from their safe citadel of common sense and go plunging about in a pool of nonsense. Apparently, man has come up through an epoch of the blackest superstition and he cannot now look back at what he does not understand without having a reversion to that primitive state where puerile fancies take the place of virile facts.

Another wave of doctrine which has swept our author off his feet is "Suggestion." This commonplace fact has become for him the god of the occult world. It accomplishes all things, explains all things—even those that are too ridiculous to need an explanation, and what is still worse, even the common things that are well understood by the thoughtful, but happen not to be clear to our author. For example, he says that suggestion explains how a child of twelve that has ceased to grow begins to do so again when measured against a young growing sapling and told that he will grow as it does. "He watches the little tree and thinks about what was said and the subconscious mind catches

on to the suggestion, and the result follows in the child's growth" (p. 269).

The difficulty here, as so often, is an inadequate psychology. Had our author mastered the known psychological laws, he either would not have written his book or would have avoided the inanities with which it is filled. It would have saved him from the Christian Science twaddle of which he is guilty. Thus, on p. 303 we read: "Jealousy and condemnation, in various forms and degrees, are prolific producers of 'rheumatism' and its kind." One might multiply quotations of this sort *ad nauseam*.

Altogether, one finds no reason why the book should be read. All that is true in it has been much better and more briefly said by others.

H. H. GODDARD.

Vineland, N. J.

THOMAS R. LOUNSBURY. *English Spelling and Spelling Reform.* (New York and London: Harper & Brothers. 1909, Post 8vo. Pp. xiv + 357.)

If you do not believe in spelling reform, you are "an ignoramus, not to say idiot," and your "proclivities are violently asinine" (p. 7). Whatever you may have to say for yourself is mere "gabble"— "the chatter of the uninformed" (p. 81), "displaying the amplest possible ignorance" (p. 10), to parallel which "the annals of fatuity will in truth be searched in vain" (p. 59).

The foregoing sentences contain a fairly complete summary of Professor Lounsbury's book. It follows, of course, that the volume is likely to be of little use in the world, except perhaps in affording considerable malicious amusement to the opponents of the view which the author advocates.

For no amount of clever shrewishness will conceal the fact that there are at least two sides—and it may be three or four—to the question of revamping our spelling. That the present orthography is highly illogical and absurd is patent enough—and hardly needs to be maintained with such persistent rancor. That this irrationality is the cause of a certain waste on the part of learners is also perfectly clear. But several considerations remain. (1) The amount and seriousness of the waste is much disputed by those best able to get at the facts, namely, the teachers of children. (2) The feasibility of any change in this country and at this time is very uncertain. (3) The possibility of

effecting some improvement, being assured, the particular changes proposed by the Simplified Spelling Board are surely lawful matter of discussion. It does not seem necessary to go into any one of these questions in this connection; for Professor Lounsbury raises no points in regard to them which have not been made tolerably—if not intolerably—familiar to all through the activities of Mr. Carnegie's board of propaganda. But it is a matter, not of argument, but of simple fact, that the considerations named have had weight with men and women—teachers, physicians, lawyers, clergymen, publishers—who cannot in seriousness be described as grossly ignorant or unintelligent; and have been supported by arguments which may indeed be answerable, but which it is as inaccurate as it is discourteous to call "idiotic," "fatuous," or "asinine.."

The pity of the thing is that the present moment would have been the psychological one for the appearance of the right kind of book on this topic. The first fusillade of "bulletins" from Number 1, Madison Avenue has apparently been exhausted. The fury of the answering volleys of editorials and communications has also subsided. There remains, on the part of many thousands of intelligent and progressive people—including most of the teachers of the country, whom especially the reformers should wish to reach,—a certain amount of real interest. These people are not hungering for more polemics; they are not amenable to controversial bulldozing. But they would be glad, now that most of the smoke has cleared away, to get at the rights of this matter—to find out, if they could, what they ought to do about it, or, at any rate, what they ought to have their children taught. A succinct and dispassionate summary of the whole argument pro and con would, I believe, have had a wide reading, and might conceivably have contributed materially to the advancement of the movement which Professor Lounsbury has so much at heart.

But what does he expect to accomplish, or whom does he hope to conciliate or convince, by this long-winded orthographic scolding—these three hundred pages of rambling vituperation? This kind of writing was considered effective in the days of John Dennis, but its inadequacy to produce any results other than irritation is now so thoroughly recognized that any long piece of it seldom attains the imprint of a first-rate publisher. Any one not already committed body and soul to the cause of the Reform is likely to be so much put out by the continual tongue-lashing he receives that he will be unable to give the interspersed arguments the attention they would otherwise obtain.

C. M. McConn.

University of Illinois.

ALEXANDER MEIKLEJOHN. *Competition in College.* Brown Alumni Monthly, **10**: November, 1909, 75–78.

This article deals with the use of competition as an incentive in intellectual work. Though written from the standpoint of collegiate instruction, it discusses principles that apply equally well to work in the schools.

President Lowell, in discussing recently the aims of collegiate instruction, said: "Universities stand for the eternal worth of thought, for the pre-eminence of the prophet and the seer; but instead of being thrilled by the eager search for truth, our classes too often sit listless on the bench. It is not because the lecturer is dull, but because the pupils do not prize the end enough to relish the drudgery required for skill in any great pursuit, or indeed in any sport." He goes on to advocate the extension and intensification of the competitive element in college work, and asks whether by introducing into the field of study the spirit of competition which dominates and surrounds the gridiron, we cannot create the same attitude of patience, industry and devotion by which athletic victories may be achieved.

Dean Meiklejohn points out, however, certain defects in the analogy between scholastic and athletic competition. Thus, the elective system, by giving to each student a different group of studies, has made impossible any even or fair competition in the college as a whole. Again, as President Lowell himself has pointed out, "the athlete makes appeal to the imagination of his fellows not because he is engaged in competition, but *because he is representing his college.*" On the other hand, the student who wins an intellectual prize is in the eyes of his fellows a good man, "but he is not, in the same sense as the athlete, *their man.*"

Competition, then, may not be the only way, or even the best way, to improve the work of our students. The Princeton plan of bringing students and teacher into constant and intimate contact in dealing with the things of the mind is a line along which progress may be sought.

In general, thinks Meiklejohn, "we are far too timid and compromising in our preaching to the students that the college of their devotion is first of all a place of the mind. We hear in our colleges altogether too much preaching of character as the aim of instruction and altogether too little of the glories of intellectual activity and achievement."

Finally, a fundamental source of difficulty lies in the fact that "for the most part our boys come to us from a society in which scholarship is held in little regard, and they are preparing for careers in which intellectual interests are to play little part. It is the task of the American

college to exalt the intellectual values in a community whose values are very largely practical, not hostile to the scholar, but simply indifferent to him."

JOHN FRANCIS.

CHARLES W. ELIOT. *Education for Efficiency, and the New Definition of the Cultivated Man.* (Boston: Houghton Mifflin Company, 1909. Pp. VIII, 58. 35c.)

The two addresses which constitute this little volume will have permanent value in educational theory.

"By efficiency I mean effective power for work and service during a healthy and active life." In education for power and knowledge, he emphasizes the training of the senses and the care of the body, the habit of quick and concentrated attention, the power of consecutive thinking, the discernment of beauty and excellence, the lawful and productive use of liberty, the passion for truth, and the motive power of enthusiasm. "Education for efficiency must not be materialistic, prosaic, or utilitarian; it must be idealistic, humane, and passionate, or it will not win its goal."

"The cultivated man is to be a man of quick perceptions, broad sympathies, and wide affinities; responsive, but independent: self-reliant, but deferential; loving truth and candor, but also moderation and proportion; courageous, but gentle; not finished, but perfecting." To this end he lays special stress upon science and service, skill and labor, character, the power of literary appreciation and expression, knowledge of nature and of men, and the training of imagination.

C. E. S.

W. NOYES. *The Ethical Values of the Manual and Domestic Arts.* Proceedings of the Northern Illinois Teachers' Association, 1909. Pp. 6–17.

The manual-training movement in America has passed through three stages of development, and is now in a fourth stage. The first stage, the author tells us, was characterized by the "Russian" system, an attempt to abstract the processes common to a number of wood and

ironworking trades, and to teach these processes as processes. Except so far as, in an anticipatory way, it prepares one for social usefulness, it is distinctly non-social and non-ethical. The second stage is most closely identified with the "Swedish" or "Sloyd" system. This differed from the "Russian" in emphasizing certain social features of hand-work. It aimed to reëstablish domestic industry in Sweden, as an offset to the influences of machinery and the factories. In a narrower sphere, it was intended to inculcate habits of neatness, accuracy, and carefulness, and a respect for labor. The third stage was initiated by the growing interest in the Arts and Crafts movement. This movement was, in its inception, ethical in its nature. As represented educationally in manual training, it revieved some of the ideals of craftsmanship that characterized the mediæval guilds. Manual training, when dominated by these ideals, could scarcely escape impressing pupils with the fact that wealth is created by effort, and that the production of wealth is essentially a social act. The fourth stage, which the manual training movement is now entering, is very closely identified with industrial education, and it is here, the author believes, that the ethical value of manual training can be most richly realized. "No system of manual training . . . . tacked on to an ethically barren school system can be pregnant with great volumes of virtue." When the school recognizes the industries in its curriculum, and when pupils are permitted to participate in these industries "for the sake of obtaining a growing social consciousness," then, the author assures us, manual training will come into its own as a means of moral culture.

W. C. B.

HENRY FISHER. *Psychology for Music Teachers.* (London: J. Curwen & Sons, Ltd., 1905. 3s.)

Although four years old, this book is here noticed because it is practically the best of its kind. It is not a fragmentary attempt to restate the elements of psychology, but a frank and scholarly statement of facts in music from the point of view of psychology.

Those who write applied psychology in other fields, here find an excellent point of view. In psychology of music, painting, architecture, business, etc., which has to be presented to people who do not know psychology, the aim should always be—not to present an outline of psychology but—to describe the facts in question from a psychological

point of view, with psychological insight, and in untechnical language. We can no more present psychology in a brief and handy outline, than we can present literature in that way.

C. E. S.

BELLE RAGNAR PARSONS. *Plays and Games for Indoors and Out.* (New York: A. S. Barnes and Company, 1909. Pp. xl, 215. $1.50.

The aim of this excellent manual of "rhythmic activities correlated with the studies of the school program" is to infuse a thought content and a spirited play into the regular gymnastic drill. The child is led to act in playful imitation of the industrial, social, heroic, and historic life of man. The physical exercise is thus vitalized and may be a means for the development of the child's ethical and social nature as well as the body. When we realize that mind and body develop through play and that the chief realization of life, both in the child and in the adult, comes in the playful attitude, we realize that the reorganization of physical exercise such as is here given, is psychologically sound.

C. E. S.

C. W. CRAMPTON, M.D. *The Folk Dance Book.* (New York: A. S. Barnes and Company, 1909. Pp. x, 82 quarto. $1.50.)

This book for the elementary school class room, play ground and gymnasium, compiled by the director of physical training in the New York Public Schools, places in the hands of the teachers of the public schools and play grounds the description and the appropriate music for the folk dances as now used in the course of study in New York City. The music is accompanied with full directions.

C. E. S.

H. CARR and J. B. WATSON, *Orientation in the White Rat.* Journal of Comparative Neurology and Psychology, **18**: 1908, 27–44.

In a previous paper these authors advanced the conclusion that kinæsthetic and organic sensations play the most important part in the acquisition of labyrinth habits by the white rat. This conclusion was reached by means of experiments which excluded the use of the other

senses. In the present work a different method was used for the purpose of supplementing the evidence in favor of this conclusion, namely, conditions were imposed upon the rat which would tend to bring out clearly the importance of the kinæsthetic factor in habit-formation.

The maze was the same kind as that which had been previously used (the Hampton Court maze) and the rats were trained until they could run it automatically and without any mistakes. Then two kinds of experiments were tried. (1) The rats which had learned the maze perfectly starting always from the same given point, were set down in the maze at three other points in the true pathway, headed either in the right or the wrong direction, and their methods of orienting themselves were noted. (2) A section across the maze was cut out so that by its removal certain runways could be shortened although the turns and the alleys would retain the same relations to one another. The effect of this change on the rats' conduct and their methods of readjustment were observed. The animals were three normal males, two blind males, and three normal females. With one exception no differences were noted between the behavior of the blind and the normal animals. In the first series of experiments, the results show that although the situation was not wholly new to them, they did not orient themselves immediately but exhibited a number of random movements, ran back and forth in the runways, turned corners, and then, usually at certain distinctive points in the maze, seemed to pick up some familiar cue and finished the trip in the usual automatic fashion. The manner in which this cue is obtained, the authors consider, offers support to their theory that the automatic behavior of the rat in the maze is governed by internal (kinæsthetic) impulses, that these impulses are released when the animal experiences some of the characteristic motor situations which have helped to form the habit of running the maze correctly.

The second series of experiments gives additional support to this theory. When the runways were shortened by removing the middle section of the maze, marked disturbances in conduct occurred, such as running squarely into the ends of the shortened alleys, entering blind alleys, making slow, hesitating movements, nosing the walls, and making compensatory adjustments. It frequently took a longer time to eliminate these disturbances than it had taken the rat to learn the maze in the first place. After the shortened form of maze had been thoroughly learned the section was again inserted. Again disturbance in conduct occurred, taking the form chiefly of running into the wall at the places where the turns had been in the shortened form of the maze.

The results of these two experiments combined with those reported in the earlier paper form rather conclusive proof that the kinæsthetic factor in the adjustment of the rat to the maze is of fundamental importance.

In conclusion the authors contrast the behavior of the rat in the maze with that of human beings in a similar environment. Both can form habits of the kinæsthetic-motor type which become absolutely automatic. At this stage, the "movement to come" is released at the proper time by the kinæsthetic impulses aroused by the movement which has just been made. When the automatic series of movements has been disturbed, however, some other means must be utilized to effect a readjustment. These means in man are visual, auditory or tactual impulses, "distance sense cues." The rat, however, has apparently no such distance sense cues, but, according to the authors' hypothesis, it has the possibility of receiving kinæsthetic cues which function for control exactly as do visual cues in man. The rat receives this cue by traversing at random any "unit" of the maze. "The group of afferent impulses (kinæsthetic) which are aroused by traversing this unit releases the proper adjustment (i. e. the old movement which has been synergized on many past occasions with this particular group of impulses) and the automatic character of the movement is again restored. On this supposition man's kinæsthetic habits would differ from the rat's mainly in that whereas the former utilizes distance sense cues for reëstablishing automatic adjustments, the latter uses kinæsthetic cues."

ADA W. YERKES.

Cambridge, Mass.

W. W. CHARTERS. *Methods of Teaching.* (Chicago: Row, Peterson and Company, 1909. Pp. 255.)

It is usually difficult to foretell just what field an author will cover in a book entitled *Methods of Teaching.* One may find, for example, details of special methods in the various school subjects, a discussion of general methods from some particular standpoint, or a discourse on the principles of psychology as applied to education. Professor Charters' book is a text on the general method of teaching subject matter from the standpoint of the nature and origin of subject-matter and its relation to society in general, and to the child.

The general point of view is the functional one now dominant in philosophy. The author assumes that subject-matter has been organ-

ized and preserved to satisfy human needs, and that the subject-matter selected for the school is that which will satisfy the most fundamental and general needs. Also any unit of subject matter is best presented when the need for it is actually or potentially present in the experience of the pupils.

From this point of view, it becomes "necessary to discuss the methods of arousing the appropriate needs and the conditions under which they are found present, and to investigate the methods pursued by experience both in satisfying these needs, to the aid of which subject matter is invoked, and in securing the maximum degree of such satisfaction."

Attention is called to the desirability of distinguishing the aim of education from the standpoint of the pupil, of the teacher and of society in general, and of determining the relation of all of these to each other. The pupils' needs present the teacher's way of approach, and are the naïve beginnings out of which grows the aim as society sees it.

As for methods of teaching from the standpoint of the text, "*the aim of education is to assist the pupils to appreciate and control the values of life.*" A *value* as here used means anything worth while, *e. g.*, social efficiency, culture, a vigorous physique, making a living. By *control* of values is meant the ability to lay hold upon and secure them. It stands for efficiency. Hence the main problems to be discussed are (1) Subject-matter, the instruments available for the control of values; (2) Methods by which motives for acquiring control of these instruments are secured; (3) The process by which these instruments are acquired by the pupil; (4) The process by which the use of these instruments becomes easy and accurate. The first of these problems receives the attention of about 80 pages the second 70, the third 50 and the last 10.

A discussion of subject-matter is not practicable apart from a discussion of method, since the method of teaching a subject is the manner of development and organization of the subject-matter in the minds of individuals. Subject-matter has originated and been worked out where there has been a breakdown in old ways of acting.

There are different aspects of the function of subject-matter to be distinguished. First the intrinsic function, or the purpose for which the subject-matter is now used by the race, irrespective of school conditions; second, the indirect functions, including the disciplinary, the preparatory and the decorative. The first duty of the teacher is to determine the intrinsic function of each unit of subject-matter. Hav-

ing determined the function, the structure will likewise be determined, for a structure of subject-matter is an organization of parts for the purpose of fulfilling some function. Numerous excellent illustrations are here given of the function of particular units of subject-matter and of the fact that the structure is determined by the function. The same general subject-matter may of course have different functions with relatively different organizations.

As to the teaching of subject-matter, its great problems are getting the child to start work upon it, to organize it and apply it to the handling of other units of subject-matter. The child has plenty of energy, but this must be converted into a form in which it can be used to drive the processes of school instruction. This involves a knowledge of what things are considered of value by the pupils, how to find or create situations in which they are conscious of not having control of this value, and finally the subject-matter which is designed to give this control. Subject-matter may be of mediate or immediate interest. Where mediate interest is relied upon, the values desired by the child may be either generic (*e. g.*, desire for good standing, honesty), or specific (*e. g.*, the building of a box). The permanent and universal generic values are the ones to be developed and relied upon in the main. Chief among these is obedience. Many suggestive examples are given of methods of securing motives in regular school studies.

In the treatment of processes of acquiring subject-matter, the discussion of the relation of the logical organization to the psychological is of interest. If the recitation follows the logical outline of the day's lesson point by point, there is little opportunity for any original thinking by the pupil. The logical organization is arrived at in the summary and occurs whenever the development has gone far enough and there is danger of forgetting. In this connection the question is raised as to how far studies should be presented incidentally, and how far in formulated courses. In brief it seems that the incidental study should come first and continue until the pupils reach a point where formulation is necessary. In those studies in which a good deal of incidental work has already occurred, the logical order of presentation may be followed. For example in introducing some high school studies, such as physical geography, one might well start with the discussion of such questions as, "What makes wind blow?" "What are the prevailing winds here and why?" Such questions might be made to cover most of the important material and then the pupils might be turned loose upon the text with their rich content to help them out in reading it.

Finally the place of drill and application, the process by which the use of these instruments becomes easy and accurate, is indicated. Subject-matter has three uses,—cultural, instrumental and disciplinary. The cultural conception views it in relation to appreciation, the instrumental in relation to control, and the disciplinary in relation to skill in control.

Skill may be secured by drill and by application. Drill means repeating over and over in the same situation. Application means the use of a unit in a new situation. Learning principles is child's play compared with making wise applications. It is altogether unsafe to assume that because a pupil knows a principle he can apply it. In application alertness, strength of purpose and resourcefulness are all neccessary. A plea is also made for more emphasis upon drill, as most of our pupils are decidedly lacking in readiness of information. The last two chapters contain some good suggestions on the assignment of lessons, and on the writing of lesson plans by teachers in training.

Altogether the treatment of the field covered is admirable. At first glance one is inclined to think that the scope of the book is not sufficiently extensive for a normal school or college text; but on second thought this criticism seems unwarranted. Teachers of general methods usually make the course too extensive for immature students at the expense of making it less intensive and practical. As to content, its newest and most commendable feature is its treatment of subject-matter as such.

In literary style the text is a model. It is clear, direct, forceful and logical throughout. Good summaries are given at the end of each chapter.

Its standpoint is fundamental and logically worked out, with due regard for the actual conditions of school work on the one hand, and in accordance with sound psychological principles on the other. While it is decidedly a text on general method rather than special methods, there is such an abundance and variety of concrete illustration as to lift the book entirely out of that class of text which is so highly abstract as to be largely unintelligible to the immature student of teaching.

B. R. Simpson.

Brooklyn Training School for Teachers.

LEWIS F. ANDERSON. *History of Common School Education.* (New York: Henry Holt and Company, 1909. Pp. xxi, 308.)

Since the days of Philobiblius so many texts on the history of education have appeared that there would seems to be little need of a new one unless it varies from the traditional lines of treatment. This variation is indicated in the second aim of this book, as set forth in the preface, "To give in outline an account of the science and art of common-school education that will aid the teachers in working out effective methods of instruction and organization." This purpose is unique and desirable; it makes the history of education a comparative study, substituting chronological for geographical areas, without sacrificing the other benefits that inhere in the subject.

In working out the book Doctor Anderson has realized his aims very satisfactorily. His presentation of the subject-matter and methods used in Roman schools (pp. 42–51, 53–66), of the medieval course of study (pp. 92–128), of courses of study and methods in English seventeenth century schools, (pp. 216–19), and his discussion of the Great Didactic of Comenius (pp. 232–37) are good types of the clear presentation of historical conditions that give a basis for intelligent comparison with present-day school work. I know of no general history of education that gives so good a treatment of the development of English schools. The range of topics treated is unusually broad for a book of this size; good judgment is shown in the selection of topics; and their treatment, though often brief, is clear and to the point.

This book will have its largest field of usefulness in normal schools and academies, though the discussions of the topics mentioned above will make it of value as a supplementary text in higher institutions.

ARVIN S. OLIN.

The University of Kansas.

E. DAVENPORT. *Education for Efficiency.* (Boston: D. C. Heath and Company, 1909. Pp. 190. $1.)

This is a strong, timely, and thoughtful appeal for industrial education, especially with reference to agriculture. According to the subtopic it is "A discussion of certain phases of the problem of universal education with special reference to academic ideals and methods." The author is dean of the college of agriculture and director of the experiment station in the University of Illinois. The main arguments

of the book have been epitomized by the publishers essentially as follows:

American education aims to be universal: it must serve all the people in their needs for everyday life; it must touch and uplift not only all classes of men, but their industries as well. The purpose of the school is to make men ready for life: they must be educated for efficiency and service through vocational studies. Industrial education should be a part of the general school system, not separated in independent schools; to teach all subjects to all men in the same school is the great opportunity of America. To establish separate trade schools is temporarily easier, but it would be an inexcusable educational blunder, and a great handicap to future generations. To preserve a homogeneous people in America, to avoid class and trade lines, all should be educated under one general school system. The separate industrial school gives us a trained operative rather than an educated citizen. By grafting industrial education on our school system, we can turn out people who are both efficient and cultured. Industrial courses carried on side by side with academic work broaden those who go into professions as well as those who go into trades. The high school must add vocational courses or face a permanent decine under the onslaught of independent vocational schools. The proper blending of vocational education with the non-vocational courses is the way to keep the boy in school. One-fourth of the time of school children should be devoted to something distinctly vocational: utility does not lessen the educational value of a study. Occupations and industries are fast gaining their place in the universities; elementary education also is in this sense becoming universal to a sufficient degree. The weak place is the secondary school which touches the young people during their formative period, and should therefore offer them a real preparation for life. *Agriculture,* which engages the time and attention of half of our people, deserves an important place in the school studies. To this industry the author devotes four chapters, outlining a four-years' course, and explaining the practical method of procedure in introducing such courses into existing schools.

C. E. S.

NOTES AND NEWS

As an outgrowth of the discussions on child psychology at the meetings of the Sixth International Congress of Psychology at Geneva, August, 1909, a provisional committee was appointed to consider the organization of an International Congress of Paidology, which should be devoted to the hygiene, anthropometry, physiology, psychology, pedagogy and sociology of children. The committee met in Paris, December 27, 1909, and formally adopted plans for such a congress. The purpose of the congress is to unite under one head the various local and national societies and congresses which are investigating the behavior of children. It was decided to establish a permanent international committee on which each of the principal countries of the world should have from 1 to 10 representatives, according to the interest manifested in the subject. To Germany, France and the United States are assigned the maximum number. Seventeen countries are already represented on this committee. Further information in regard to the organization of the congress may be obtained from the President of the International Committee, Dr. M. C. Schuyten, 141 Rue Bréderode, Antwerp, Belgium.

The schools of France are still disturbed by the religious situation. Some months ago the French bishops, archbishops and cardinals issued a pastoral letter condemning the principle of religious neutrality and practically forbidding parents to send their children to state schools. The schools were charged not merely with a lack of religious instruction but with teaching, by means of the use of certain text-books, a positive hatred of the church. The schoolmasters' federation retaliated by suing the bishops for defamation. The authors of the designated text-books brought suit for damages. The Catholic parents, on the other hand, formed associations to watch the schools and see that their children did not use the proscribed text-books. The children were encouraged to resist their teachers, to burn the books, or to boycott the schools. The school authorities ordered the teachers to use the text-books furnished or to give up their positions. Recently the courts dismissed the defamation suit, but the war will doubtless go merrily on until time has assuaged the bitterness caused by the separation of church and state.

Many European cities are offering courses in experimental pedagogy to their teachers. The city of Lyons, France, by the action of its municipal council, has established a course in "experimental psychology applied to education." The resolution of the council specifically states that the course is intended 1. For teachers; and 2. "For fathers and mothers, who ought to be, but are not always, the best educators, and who, in order to plan, carry on, and complete the education of their children, ought first of all and by all means to complete their own education." The work is under the competent direction of M. Nayrac, well known for his *Étude sur l'attention* and his *Étude psychologique de la femme*.

The League of National Handwriting (France), composed of medical men, oculists, orthopedists, and teachers, has recently made a report of an investigation on vertical and slant writing. The report favors slant writing on both orthopedic and ophthalmological grounds, and condemns vertical writing as slow, fatiguing, and predisposing to cramp.

The vacation courses for teachers offered at Cassel (Germany) last summer followed two main lines. On the one hand the psychology and pedagogy of the kindergarten was emphasized, and on the other the social aspect of education received much attention. The courses were well attended and gave great satisfaction. They will be continued next summer.

The St. Louis Teachers' College will reorganize its courses next year so that the students will spend the first year in the study of educational theory, following this by a half-year of practice teaching, and completing their course with a half-year of advanced theoretical work. It is believed that the study of theory subsequent to a period of practice will prove much more effective than the present arrangement of courses, in which the practice-teaching comes at the close of the two years' work. The Teachers' College has also instituted a series of extension courses and a voluntary summer session, both of which are very popular with the teachers of the city. The college is a part of the St. Louis public school system.

In order to guard against the abuses of an unlimited elective system and to secure a certain amount of concentration and distribution of studies, the Faculty of Arts and Sciences of Harvard University has adopted rules of the following general import, to go into effect with the

class entering in 1910: 1. Every student shall take at least six of his courses in some one department, and only two of these courses may be elementary in character. 2. All courses open to undergraduates shall be divided into four groups: (1) Language, Literature, Fine Arts, and Music; (2) Natural Sciences; (3) History, Political and Social Sciences; (4) Philosophy and Mathematics. Every student shall distribute at least six of his courses among the three general groups in which his chief work does not lie, and he shall take in each group not less than one course, and not less than three in any two groups.

The Columbia College Faculty has made two changes in the requirements for the B.A. degree. The first eliminates from the list of prescribed courses the elementary physics and chemistry which have heretofore been required of all candidates. This leaves mathematics as the only technical subject required. The second aims at securing greater concentration in electives, and prescribes that each student must complete three years of sequential study in each of two departments.

The Summer School bulletin of New York University announces that, in addition to the courses offered by the regular staff, the following courses in education will be given by visiting instructors. Prof. Walter Ballou Jacobs of Brown University will give courses in "Principles of Education" and "Hygiene of Education." Dr. Felix Arnold will discuss "School Organization" and give a seminar in "School Management." Edward L. Stevens, Associate City Superintendent of the New York City schools, will give three courses, entitled "Secondary School Problems," "The Phenomena of Adolescence and their Relation to School Work," and "Methods of Teaching Science and Languages in Secondary Schools." Dr. Mary Sutton Macy of the New York Medical College and Hospital for Women will lecture on "The Psycho-physiological Nature of the Child" and "The Pathological Child."

At the Summer Session of the University of Chicago Prof. Ellwood P. Cubberley of Leland Stanford Jr. University will give two courses, one on "State and Municipal School Organization" and the other on "Public Education in America." Prof. F. E. Farrington of the University of Texas will lecture on "French and American Schools", and on "Secondary-school Organization." Superintendent Calvin N. Kendall of Indianapolis will deliver a series of lectures on "The Course of Study in Elementary Schools."

The State of Minnesota, according to a recent report of the state auditor, is in a fortunate position in regard to school funds. In 1851, before the organization of the state government, congress set aside certain lands for school purposes. The fund from the sale of these lands now amounts to more than $21,500,000 and over 3, 000,000 acres are still unsold. Part of this land lies in the iron district and at the contract royalty of 25 cents per ton it is estimated that $250,000,000 will be realized from it within the next fifty years.

For the establishment of the George Peabody College for Teachers at Nashville, Tenn., the sum of $1,000,000 has now been given by the board of trustees of the Peabody Fund for the Advancement of Education in the South. This gift was promised some time ago conditional on the granting by the state of Tennessee, the county of Davidson, and the city of Nashville of a sum approximating $750,000.—*Science*.

In the *Metropolitan Magazine* for February, Professor Münsterberg, under the title "My Friends, the Spiritualists," publishes some theories and conclusions concerning Eusapia Palladino, together with several photographs of the medium, of her cabinet and levitating table, and of some of the best-known of her converts, Lombroso, Carrington and others. Three points of special interest are brought out: first, that Palladino is not the ignorant peasant woman of the newspaper paragraphers, but a woman of cleverness, if not of culture; second, that her performances rest upon unquestioned fraud; but third, that the fraud is quite possibly unconscious, or at least that it was originally unconscious,—a case of complex hysteria with splitting of the personality.

Professor A. O. Lovejoy, writing in the *Nation*, severely criticises the recent action of the trustees of the Carnegie Foundation for the Advancement of Teaching abolishing the "service" pensions. Professor Lovejoy maintains that the Foundation will be guilty of an act of bad faith unless it modifies its ruling so that those who have already made plans based upon its earlier promises will not be debarred from the privileges which, they had been led to understand, had been duly earned by their twenty-five years of service, irrespective of whether they were elegible under the age or disability clauses. From the advance copy of the Fourth Annual Report of the Foundation, published in *Science* February 25, it is clear that the task of playing the good fairy with Mr. Carnegie's millions is not a sinecure. President Pritchett now asserts that the fund is to be

administered solely in the interests of "teaching," and not in the interests of research or of the internal harmony of university life. If this policy is carried out consistently, the present practice of granting pensions to administrative officers while refusing them to teachers in the elementary and secondary schools attached as educational laboratories to the universities may come to be recognized as somewhat anomalous. Such discrimination places the development of the laboratory school under a severe handicap; and it may be safely contended that there is no department of the university that stands in greater need of development if one sincerely desires to advance "teaching."

The principal speaker of the midwinter meeting of the Illinois Schoolmasters' Club, Peoria, February 11 and 12, was Director C. H. Judd, of the University of Chicago. The general topic of the meeting was "Drill *versus* New Content." Professor Judd maintained that, through "an intelligent relating of the facts of experience," the child could gradually be trained habitually to take the scientific attitude toward the problems of life.

The Seminary of Paidology, organized last summer at Brussels under the able supervision of Mlle. Dr. I. Ioteyko, director of the psycho-physiological laboratory of the University of Brussels, is an innovation which is worthy of careful study and imitation in this country. Intensive studies were made of child anthropometry, psychometry, mental fatigue, measure of capacities, abnormal children, paidological technique, and collaboration between teacher and physician. An interesting feature of the session was the visit to the paidological laboratory of the city of Antwerp, directed by Dr. M. C. Schuyten. The Seminary aroused great enthusiasm and will be continued next summer.

At a recent meeting of the *Société pour l'étude psychologique de l'enfant* (Paris) M. Anfroy presented the results of extended experiments in comparative pedagogy to determine whether the daily memorizing of passages in prose and poetry has any effect on French composition. Two classes of the same age and the same ability in composition were selected, and one was trained in memorizing passages of literature for two months, while the other received no such training. Tests in composition were made before the practice, immediately after, and three months after. The experiment was repeated in another school. In both cases the classes trained in memorizing showed a decided improvement over the others in both form and content.

The third International Congress of School Hygiene will be held at Paris, August 2 to 7, 1910. The importance of the subject to which the congress pertains, and the interest manifested in the first congress held at Nuremberg in April, 1904, and in the second of the series held at London in August, 1907, justify the belief that the forthcoming congress will be largely attended, and that its deliberations will materially advance the efforts for the improved hygienic conditions of schools and the physical well-being of school children.—*Science.*

Dr. George P. Brown, founder and for many years editor of "School and Home Education," died at Bloomington, Ill., February 1, 1910. Dr. Brown was one of the most influential educational editors in the country, and through his journal did a great deal to stimulate the discussion of educational problems in a philosophical spirit.

We regret to note the death of one of our collaborators, Dr. J. A. Bergström, professor of pedagogy at Leland Stanford University, formerly director of the psychological laboratory of the University of Indiana, on February 28 at the age of forty-two years. Professor Bergström was the inventor of a number of psychometric instruments, the author of many psychological articles, and the translator of Kotelmann's "School Hygiene." His death is a loss to experimental pedagogy in America.

Dr. Lewis M. Terman of the Los Angeles Normal School has been appointed to a position in the Department of Education, Leland Stanford University. It is understood that Dr. Terman will have charge of the courses formerly given by Professor Bergström.

Professor V. A. C. Henmon, dean of the College of Letters and Science at the University of Colorado, has been made professor of educational psychology at the University of Wisconsin.

Professor George Drayton Strayer, of Teachers' College, has been promoted to the chair of American school administration. A new professorship will be established to cover the field of organization and administration of foreign school systems.

Dr. Harvey A. Peterson (Ph.D., Chicago) is an appointee in the department of psychology at the Illinois State Normal University, Normal, Illinois.

Dr. David P. Barrows has been made a member of the Department of Education at the University of California. Dr. Barrows was formerly Commissioner of Education in the Philippines.

Dr. Hugo Münsterberg, professor of psychology at Harvard University, has been appointed exchange professor at Berlin for the year 1910-'11. Professor Münsterberg has been requested by the German Government to organize in Berlin an academic institute which will foster the cultural relations between Germany and foreign countries.

Mr. Frank M. Leavitt, head of the department of manual training in the Boston city schools, has been appointed associate professor of industrial education in the School of Education at the University of Chicago. Mr. Leavitt was a student and later an instructor in the Massachusetts Institute of Technology.

Mr. Frederick Bonser, now of the McComb Illinois State Normal School, has been appointed assistant professor of industrial education at Teachers College, Columbia University.

Dr. Ernst Meumann, of Halle, has been called to the chair of philosophy at Leipzig, vacant through the death of Professor Max Heinze.—*Science.*

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Manuscripts for publication, books or other material for review, and news items of interest to educational psychologists should be addressed to The Managing Editor, J. Carleton Bell, 1082 Starling Place, Brooklyn, N. Y. Research contributions from England may be sent to W. H. Winch, Esq., Melville Villa, Overhill Road, Dulwich, London.

The Journal is preparing to issue a series of Monograph Supplements for the publication of more extensive researches in educational psychology. For details prospective contributors may apply to The Managing Editor.

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